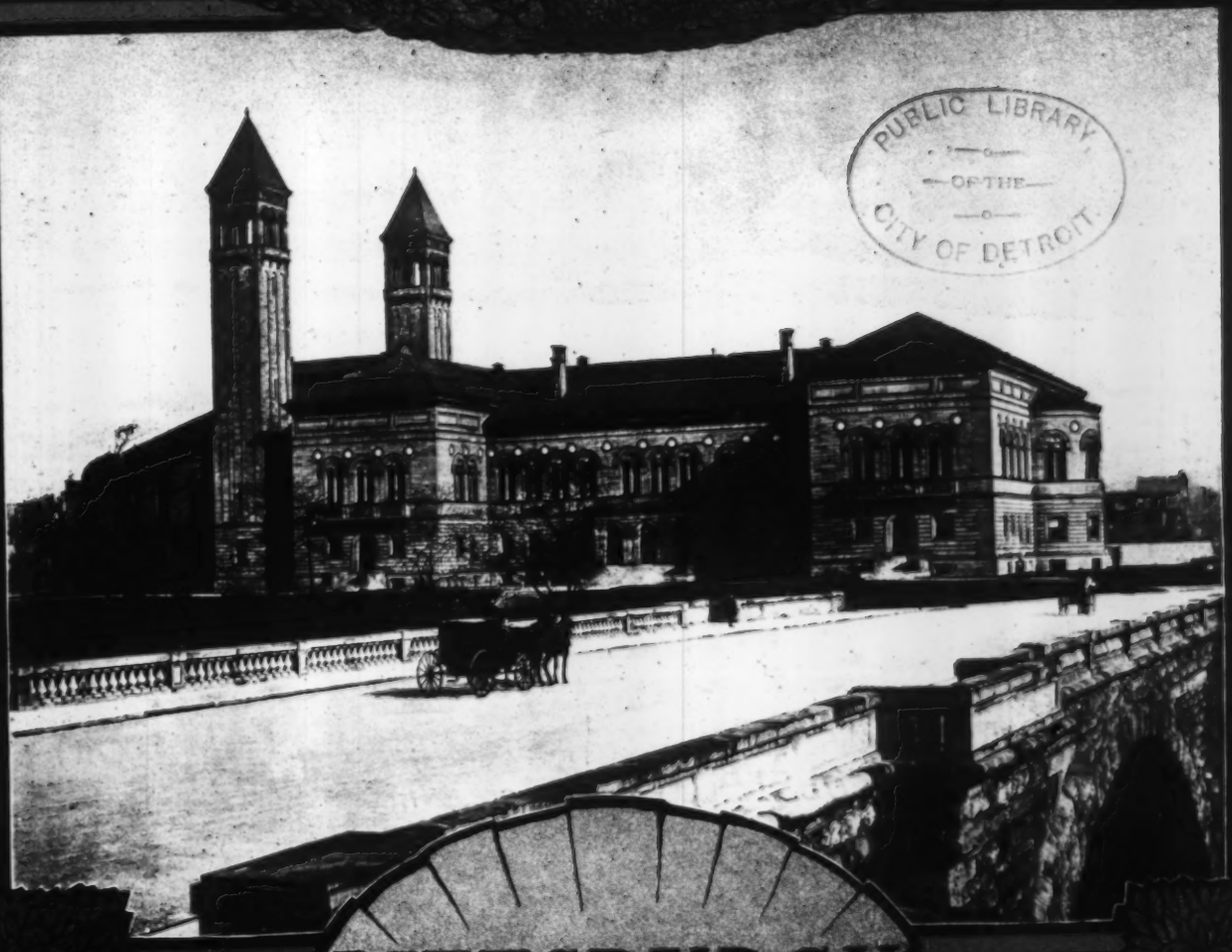
HARPER'S WEEKLY



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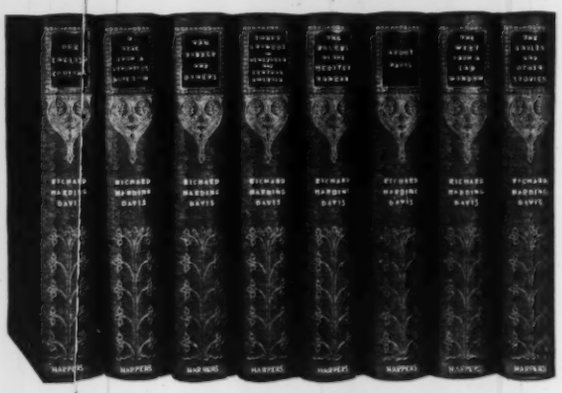

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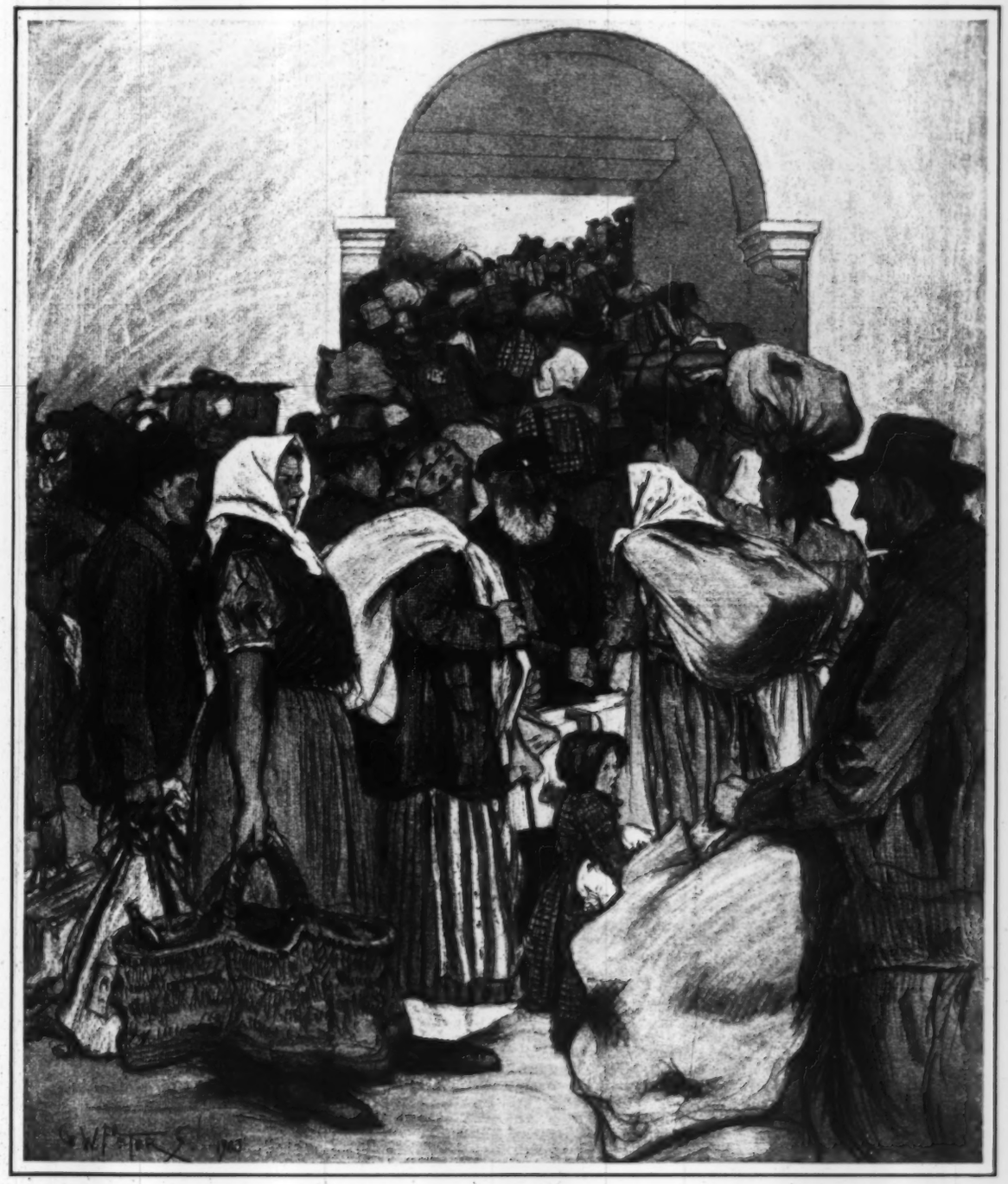


Drawn by G. W. Peters

OUR NEW AMERICAN CITIZENS

Again the weekly record of immigration has been broken. In 1902, 650,000 persons came here to live, and now it seems certain, from the record of the first three months of 1903, that this enormous figure will be exceeded this year

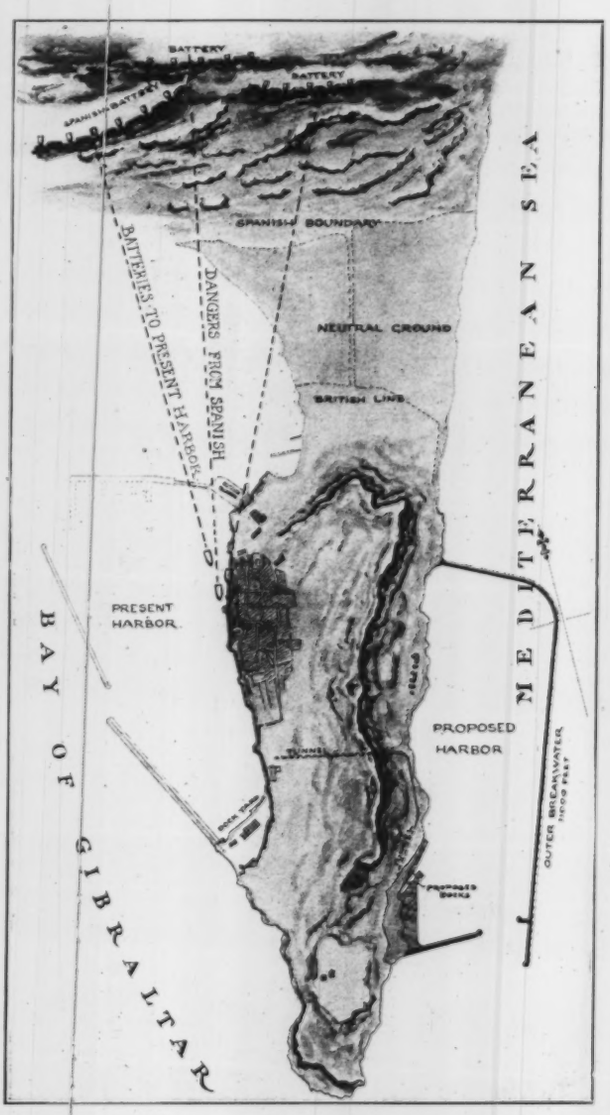
The Passing of Gibraltar

A WAVE of apprehension is at present sweeping over the English public due to the statement by Mr. T. Gibson Bowles, M.P., that Gibraltar, so pre-eminently the world's greatest fortress that the name is a synonym for strength, is in reality a source of weakness in Great Britain's defensive system, and might, under certain conditions, become a serious tax upon the fleet.

The popular idea of an impregnable fortress fails to disassociate invulnerability to capture from offensive strength, and it is safe to say that nine-tenths of the people the world over believe that Gibraltar in itself commands the entrance to the Mediterranean. This idea would, however, be a dangerous one if held by the British government. It is even less true to-day than it was in the days of sailing-ships, when accessibility to a plentiful coal-supply was not vital to the success of naval operations.

The entrance to the Mediterranean is twelve miles wide, and at half this distance foreign armored ships would have little to fear from even the most powerful of the new guns in the Gibraltar batteries. Gibraltar is not, therefore, valuable to Great Britain in the sense of a coast fortification, but purely as a naval base from which a British fleet may operate in the vicinity of the Mediterranean. Employed in this manner, since ceded by Spain in 1704, it has successfully sustained many attempts at its recapture, and under the conditions then existing was shown to have wonderful defensive powers when attacked by an almost overwhelming force. The conditions prevailing at that time make the results, however, no criterion by which to judge the outcome of an attack to-day. The object of the latter would be distinctly different: it would not be, as was the former one, the capture of the rock, but would be the crippling of the English navy by destroying one of its most valuable bases.

Mr. Bowles is performing a patriotic service in warning the British government against perpetuating the blunder originally made in establishing the dockyards and naval works on the western side of Gibraltar and within easy range of such batteries as the Spaniards may choose to erect on the high land to the northward and westward of the neutral ground. It is true that new and powerful ordnance has been installed in the batteries on the northern side of the rock and commanding the Spanish hills, and that these would probably be employed upon permanent Spanish works while in course of erection, making the fortification of the hills by large pieces of ordnance an extremely dangerous operation; but the emplacement of the heaviest guns would not be necessary to make the present harbor untenable for British ships. Powerful mortar batteries could and probably would be quickly erected, and ordnance of this character would have sufficient range and possess the proper character of fire for the purpose.



Map showing Gibraltar's present defensive Weakness, and Plans for proposed Improvements

In view of the vulnerability of the naval station it is difficult to understand why it was ever established on the western side of the rock, and it is still more surprising that in the last few years $22,500,000 should have been expended upon permanent works. The British government is apparently awakening very tardily to the necessity of establishing a new naval station and harbor on the eastern side of the rock. Mr. Bowles has been agitating the matter for several years, and his judgment has been vindicated by the report of Captain J. H. Tizard, of the Royal Navy, and Mr. William Shield, which has recently been made public. Judging from this report it would seem that much valuable time has been needlessly wasted in beginning work, which, the report states, will require ten years to complete. The labors of the commission extended from November, 1901, to May, 1902, and the report, which was not presented to Parliament until February, 1903, was made to the Admiralty in June, 1902. The commission recommends creating, by means of two breakwaters, with a total length of 12,800 feet, a harbor on the eastern side of the peninsula affording accommodation for twenty-four battle-ships, twelve cruisers, and a number of gunboats and destroyers. In addition there will be the proper complement of dry docks, workshops, and other accessories. The docks will be so placed as not to be exposed to direct torpedo attack. The entire construction, however, will not be completely shielded from a hostile fire, the report stating in its concluding paragraph: "It may be well to point out, however, in conclusion, that although the proposed harbor on the east side of Gibraltar will not be exposed to such a concentrated fire from the shore as is the harbor on the west side, it will not be altogether free from gun-fire, as the northeastern part of the harbor would be exposed to attack from Sierra Carbonera, and the whole harbor might be enfiladed from the lower hills extending east from Sierra Carbonera; the dock, however, and the reclaimed ground immediately adjacent to it, would not be open to any fire from the Spanish mainland, and could only be attacked from the sea." It will thus be seen that even the proposed harbor, by far the more protected of the two, would not be a quiet refuge for a fleet. It will, however, afford a position for a coal-supply and permanent works out of the range of Spanish guns.

The British naval authorities recognize the necessity of maintaining the two-power standard of the British fleet. To provide a yearly naval construction which will overtop the combined naval programmes of France and Russia has been a serious drain upon the British treasury, but now that the German navy is forging to the front with alarming aggressiveness it is a new factor to be reckoned with, and the financial resources of England are in danger of becoming strained. Many maintain that the yearly defence budget has reached the limit of proper expense, and that as the maintenance of the naval policy is vital, its needs must first be provided for and the army left to shift for itself on the balance. It is doubtless due to this situation that the Admiralty hesitates to request of Parliament the $32,500,000 estimated by the commission for the eastern Gibraltar harbor.

It is not only with reference to its dominance over the Mediterranean's entrance that Gibraltar's greatness is passing, but it will soon, through the construction of the Panama Canal, be relegated to second place as a strategical position. The splendid advantages possessed by Cuba in this respect will be virtually secured to the United States by a friendly government and the ownership of new naval stations, giving to our country the world's greatest strategical base. The result for England will be the supplanting of Gibraltar by Jamaica, a most important naval base. Jamaica's unique position, commanding the Windward Passage directly, and within a few hours' steaming distance of the other ocean highways to the Isthmus, gives it a strategical strength second only to that of Cuba.

As bearing on the wonderful defensive strength of Gibraltar under the conditions of other days, it is worth recalling that in 1782 the combined sea and land attack of the joint forces of France and Spain, though maintaining a siege for over three months, failed utterly to inflict any permanent damage. In this action 458 guns maintained for days a terrific bombardment at ranges of from 900 to 1200 yards. Despite the fact that the Gibraltar garrison returned this fire with but 96 guns, the loss to the allies was over 2000 men, while the English lost but sixteen in all. At its conclusion the siege had cost the Spaniards $12,000,000 and over 6000 men, while the English loss, even including those not killed in battle, was only 1231 men.

IDEALS OF AMERICAN WOMANHOOD

THE LITERARY WOMAN · BY CAROLINE DUER

Caroline Duer

I HAD been asked to write something about the ideals of literary women, but I protested, first, that I was not a literary woman, and, second, that I had no ideas about their ideals, so I see I am to be allowed "to decline on a range of lower feelings," under the title of "In Application of Talent."

Nearly everybody can write now, and does,—mostly in the magazines; the only wonder is that there should be any outsiders left to read. Some people possess genius (modestly described in the dictionary as "uncommon powers of intellect"), and are born giants in the story-telling world; and some have talent, a kind of juggling skill with words and ideas; and some, again, have a little gentle facility of expression, a sort of talent-and-water, which the pressure of necessity forces them to use, and which it requires determined application to turn to any account.

Writing is work, like any other work, whether it is a talent or not, only it is perhaps a trifle more irritating to the nerves than many an occupation less respectfully considered.

"Certainly, if I could help it," says Mr. Stevenson, "I would never marry a wife who writes. The practice of letters is miserably harassing to the mind, and after an hour or two's work all the more human portion of the author is extinct."

But there are more and more of us writing all the time, and gentlemen who feel as Mr. Stevenson did (with whom, by the way, I heartily sympathize), are going to have a hard time of it. But not so hard, I vow and declare, as the unfortunate author with pencil in hand and a brain that refuses to dictate one word.

For words "finely framed" carry you far, though ideals do not seem to count for much in the market-place. If you are a small peddler, profit or loss means a great deal to you. You *must* suit the popular taste, but you *may* cling to certain principles on which you make and sell your wares.

You may keep good models before you. You may be patient and painstaking, no matter how insignificant the result, trying conscientiously to reproduce the impressions made upon you by life and character, and, if there is no demand for your *best*, at least you may refrain from putting your very worst before the public.

Women are inclined to force their talents when they have once resolved to use them, and the result is not always permanently successful. I do not believe in doing hasty, ill-digested work after you have achieved a reputation, no matter how eagerly you are sought by once indifferent editors and publishers. But of this I can speak better when such temptation comes my way,—if it ever does.

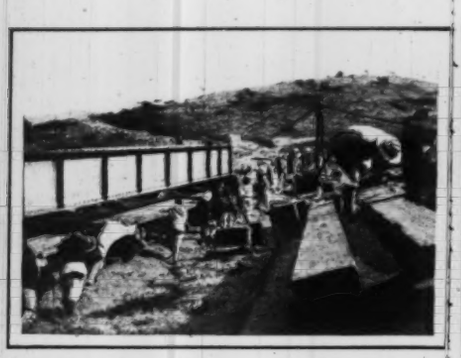
I believe that the expression of any talent should be as impersonal as possible. Writers should keep themselves out of their stories, reporting human nature,—with some tenderness, a sense of humor, and, as far as they can manage, with a trust in the higher, rather than the lower, side of it. I do not like, when I put down a book, to feel, primarily, that the man or woman who wrote it considered himself or herself a clever person. I like to arrive slowly at that conclusion through my appreciation of his or her delineation of character.

I admire simplicity, force, and directness, and I wish very much that I had not been asked to write this article, because it seems to bring all my own shortcomings in that respect so hideously before me.

I suppose you never lay down a piece of writing, no matter how small, without a sense of relief that it is finished, although it may have fallen so far below your standard of merit that some day you may regret that you ever did finish it at all. But ideal standards are appreciated by few, and attained by fewer, and in the mean time the workaday world wants something that will amuse or interest it without too much effort on its part, and you make an effort, on your part, to supply what it wants with such talent as the Lord gave you, and such application as you can force from yourself, and the result is in the hands of those terrible autocrats who threaten you with the opinion of the "Average Reader."

I should like to meet the average reader. He seems to be conventional, moral (unless wickedness is approached with great solemnity), a lover of adventure, a person with a certain sense of humor (only it must be developed along the lines to which he is accustomed, or he'll have none of it), and lately he has, apparently, acquired an overpowering taste for social life and happenings. At least so some of the autocrats say, and the application of talent to the description of social happenings is somewhat lowering to the ideals. Perhaps the average reader would tell us a different story if we could consult him personally,—a story much better worth hearing.

Be that as it may, we stand or fall by what we manage to accomplish, not what we dream of attempting, and the apology of the chronicler of Judas Maccabæus might very well be adopted by all modern writers, whether they work laborously with small talents to please others, or soar with ideals to satisfy themselves.



Moving a Girder over Rough Country

Mr. A. B. Lueder
The American in charge of the expedition

One of the Transportation Trains

27 Bridges in 53 Weeks

AN American bridge-building company, represented by a boy of twenty-four, has just completed twenty-seven railroad bridges for a British line in Uganda, Africa, in record time.

The Uganda Railway is a line running from the coast above Zanzibar to Victoria Nyanza, the principal source of the Nile. Its construction presented difficult engineering problems, as the land rises sharply to nearly 9000 feet above sea-level, and necessitates a two-per-cent. grade much of the way. The road follows a tortuous course through broken hills and over numerous deep ravines.

After the British bridge-builders had taken two years to construct eight viaducts, it was resolved to place the rest of the work in the hands of American engineers. An American firm undertook to do the work, and to finish the bridges complete for a sum less than that asked by British contractors for loading the material on shipboard. The contract with the American concern called for the completion of the work within seven months after the foundations were complete; an unforeseen delay, however, extended the duration of the work to a little over a year.

A graduate of Cornell, Mr. A. B. Lueder, of Wilkesbarre, Pennsylvania, was put in charge of the entire work of construction. He took with him to Africa twenty American "riggers," as the bridge-builders are called, together with 150 sailors and longshoremen from India; 150 native Africans were later pressed into service.

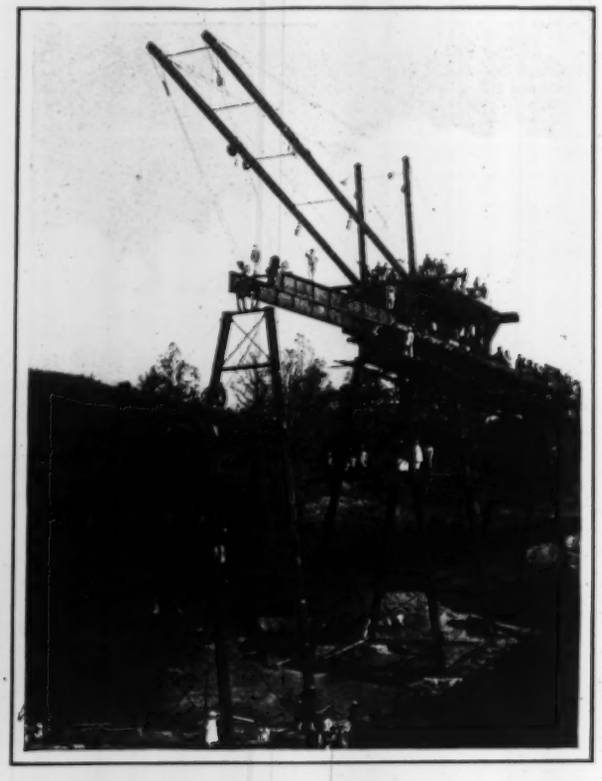
The British contractors shipped their material from England in small pieces, while the American company hired three tramp steamers which transported the bridges, practically complete, from the shops in Philadelphia to the African coast. All that remained to be done was to set the pieces in place, drive some rivets, and the bridge was ready for the rails.

In the actual work of construction, the British and American methods were still more divergent. The British idea was to employ as many men as could be had; the American, to do with as few as possible. The accompanying pictures illustrate this contrast. Five men and an American "traveller" did the work of over a hundred natives employed by the British contractors. One of the longest of the viaducts was put up by the American force in sixty-nine working hours, to the surprise and admiration of the English engineers in charge of the line.

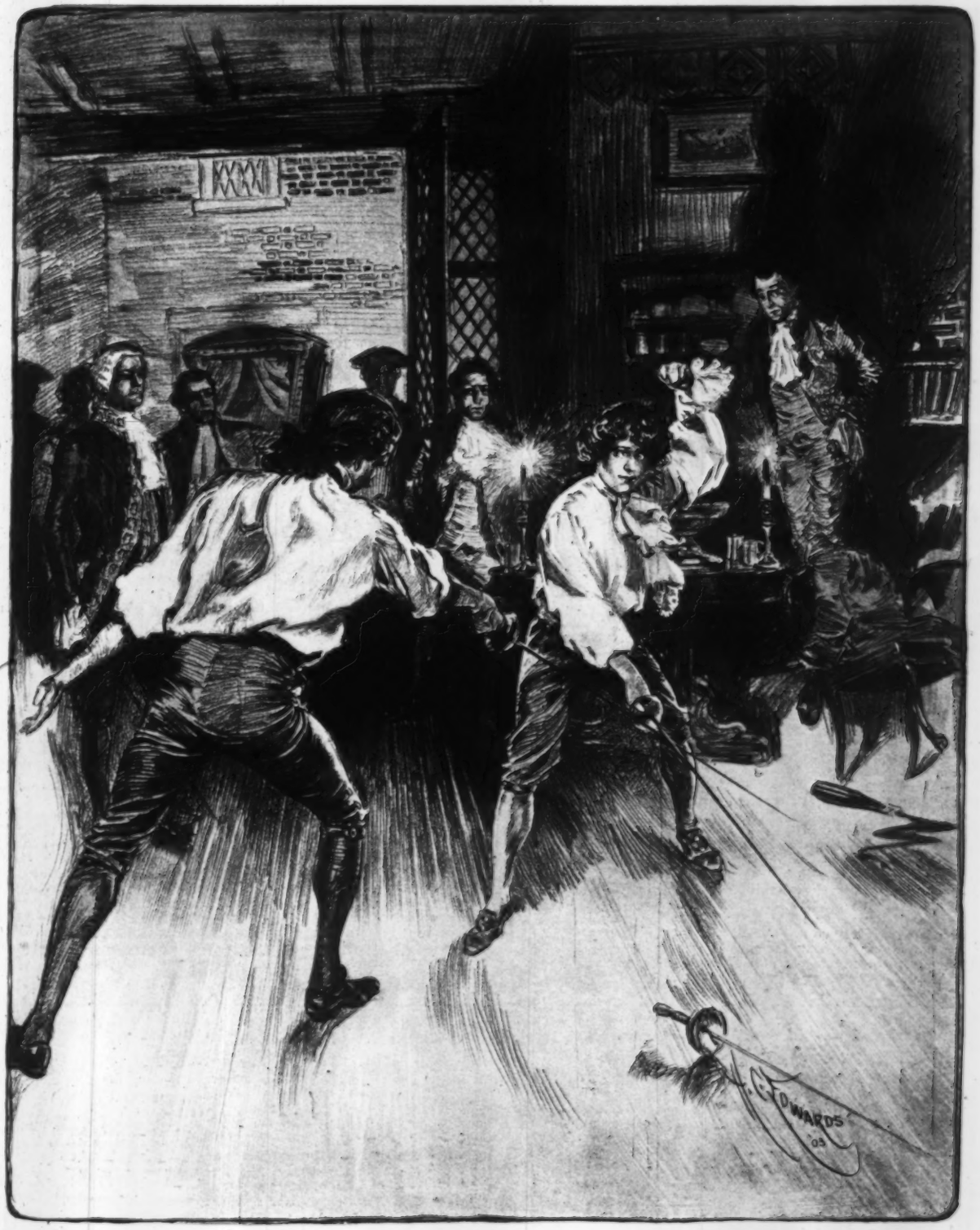
The actual engineering work was simple. The bridges, of which the longest was 1200 feet and the highest 112 feet, were almost entirely on curves and steep gradients; but, thanks to the perfection of the construction work at home and to the soundness of the foundation work by the British engineers, everything fitted admirably. There were 7000 tons of steel in the entire contract, and the difficulties of transportation and erection would have been serious except for the foresight and discipline of the men in charge. The great travelling crane did most of the work, with never more than a score of men on the job at once.

In December of last year the work was completed and accepted by the British government. It should be said in fairness to the contractors, that they do not consider their work in Africa remarkable in any way. They simply took the contract and filled it with characteristic American promptness.

American Bridge-builders at Work—only Five Men needed



The British at Work, employing a Force of over a Hundred



Drawn by H. C. Edwards

"MY LADY PEGGY GOES TO TOWN," AT DALY'S

Peggy (Cecil Spooner), impersonating one of her suitors, fights Sir Percy (Mr. Hale), her lover

Translating Weather Reports received in Cipher, and Charting them on the Maps

Will it Rain or Shine To-morrow?

The Way the Weather Forecast is made at the Weather Bureau in Washington

IT was an evening session. The matter in hand was to give to the United States, in its morning papers, a hint of the probable weather conditions of the ensuing day. The means were some smudged sheets of telegraph manifold, plus the sum of the experience of the United States Weather Bureau.

At five minutes before eight, morning and evening, telegraph circuits are made up covering the United States and extending into Canada, so that there shall be, as far as conditions may allow, simultaneous transmission of the reports of about one hundred and fifty weather observers to the Weather Bureau in Washington.

By the first quarter after eight, messages have begun to come into the telegraph-room of the Weather Bureau that read, for example, like this, "Tafeta lushberg beak baggy." At 8.30 exactly, five clerks are at a high desk which describes three sides of a parallelogram, and a sixth clerk perched at a separate high desk begins to drone figures and abbreviations with wonderful rapidity and continuity.

"Ninedoo thirdfour teen rain north cloud," he says, and the clerks on the inside of the "hollow square" make the final translation thus:

The telegraph: "Tafeta lushberg beak baggy."

The reader: "Ninedoo thirdfour teenrain north cloud twelfordy."

The clerks: "Barometer, 29.92; thermometer, 34; precipitation, .14; direction of the wind, north; cloudy; velocity of the wind, 12 miles; maximum temperature, 40."

Each clerk has an outline map of the United States before him. The observation stations are noted on the map with little circles. Underneath the map on which the clerk is working are maps on which the observations for previous days have been plotted. Clerk No. 1 is putting down all the data; Clerk No. 2 takes the temperature only, and before the next temperature is called has calculated and put down the figures representing the change from the previous observation and the difference from the normal. Clerk No. 3 is handling the barometer readings, and noting the variations from previous observations. Clerk No. 4 is noting, with little wriggles of red and blue pencil marks, the presence of clouds and their character. Clerk No. 5 is putting down figures in gross on a blank for the Associated Press, which will notify every city of the day's climatic conditions in every other city.

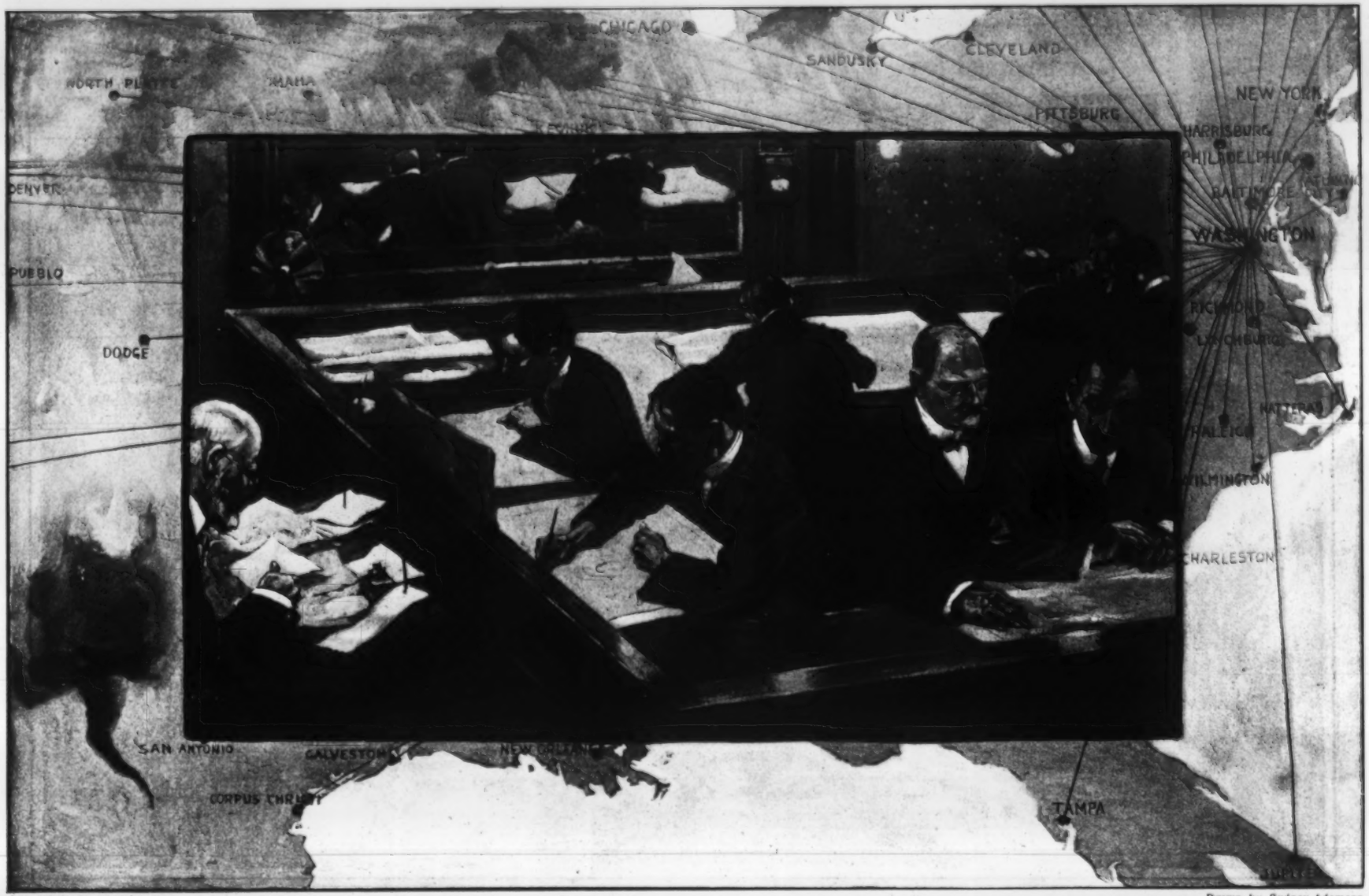
About this time, the forecast official, who sits sixth at the desk, begins to scribble furiously on a pad. He presses the first sheet with fervor into the hand of a waiting printer, and the craftsman shuffles off to his case of logotypes. The making of the night forecast has begun.

Before nine o'clock, the reader has tumbled off his stool and announced that the reports are all in. The forecaster stands before the combined map and delivers his dictum to Clerk No. 1, who is writing it out for the printer. Lines isotherm and lines isobar are racked to give up the secret of the weather for the next twenty-four hours. This is latter-day necromancy for the benefit of some seventy millions of people who will read the prophecy to-morrow for overcoat and umbrella directions.

The clock ticks second by second toward that time when the forecaster must say what the weather for the next twenty-four hours will be. Section by section he goes over the country and apportions to each its meed of prophecy, while the logographs click in the printer's stick in the corner, crystallizing divination into news. At ten the forecast in all its subdivisions is complete, and by eleven or shortly thereafter the Associated Press has sent out a forecast of the weather for the following twenty-four or more hours from the printed slip furnished by the bureau, and from which slip, printed and made permanent at 10.15 o'clock on the night before, the nation gets its day's weather wisdom.

Putting the Weather-symbol Type in Place

Measuring the Heat received from the Sun



See article on opposite page

Drawn by Sydney Adamson

MAKING THE WEATHER FORECAST AT WASHINGTON

This drawing represents the scene at the Weather Bureau in Washington, showing the force of clerks receiving the weather reports from all over the country, and making up the official forecast. These reports are sent to the newspapers in all the large cities every evening

Drawn by The Kinneys

"TAP-DAY" AT YALE

Each of the three Senior societies at Yale,—"Scroll and Keys," "Skull and Bones," and "Wolfs' Head,"—elects fifteen members annually from the Junior Class. On Tap-day, the Thursday before the last Tuesday in May, the elections are publicly announced. Crowds gather on the college campus, and the Seniors indicate the successful candidates by giving each one a vigorous slap on the shoulder, with the command, "Go to your room!" Then the crowd cheers and yells as the candidate obeys the summons

Captain Little Again

By W. E. Cairnes

"'If there's only 'arf a chance Jack must get the cross'"

WE were lying off a favorite yachting port in the Highlands. The Admiral had signalled "general leave," and I had noticed Lester going over the side into the cutter which was taking the liberty men, so I decided to go on shore too. When I landed, I saw Lester sitting on one of those stone posts which seem for some mysterious nautical reason to be placed on all jetties. When he saw me he rose and saluted ostentatiously, then walked away, once or twice looking back over his shoulder as if to see if I was following him. I was quick to take the hint, and soon found myself walking along the old coach road leading inland, the scarlet coat of my guide showing a few yards ahead. A fine clump of trees, standing some fifty yards back from the road, at last attracted Lester's attention, and, quitting the road, he waited for me in their shade. When I joined him, he lost no time in getting to business.

"I beg pardon, sir, for bein' so bold as to suggest as you should come out 'ere to 'ear my yarns, but they've some idea in the ship, sir, that I've been talkin' more than is good for me, though you could tell 'em that I've said nothin' as wasn't true, and nothin' as would 'urt any of them. But I'll spin you the yarn, sir, and then you can make what you like out of it.

"This as I'm a-goin' to tell you about 'appened in the early nineties. I was in the *Bantam*, second-class cruiser, on the Cape station. Little ('e 'ad the V.C. then) was the captain, and the commander was King, a good officer, and a fine seaman, sir. The English mail 'ad come in one mornin', and 'alf the ship's company 'ad got their little bit of 'ome come out to them in the Donald Currie boat a-layin' in the bay. I was cleanin' guns on the poop, and Jo was a-settin' on the poop skylight a-readin' 'is mail. From what 'e said as 'e muttered it half aloud to himself, the letter must 'ave been from his son, who was in the service, as it said that this 'ere son was a-comin' out to the station by the next mail, 'im 'avin' been appointed to our chummy ship, the *Musk Rat*, third-class cruiser on the station, as Number One and G. This bit of news pleased the old man tremenduous, and 'e kept a-walkin' up and down and a-sayin' to 'imself, 'What—ho! Jack on this station! Blow me, that's good news! Bust me, if there's only 'arf a chance Jack must get the cross. Two crosses in one family—father and son, begad,' and so on for 'arf an hour or more.

"Well, time goes on, and at last the son, Jack Little, 'e arrives. The *Musk Rat* were round at Simon's Bay, but she were about to make a passage round to Cape Town, and the young feller 'e were ordered to wait for 'er; so 'e took up 'is quarters with us in the *Bantam*, livin', in course, with 'is pa in the Owner's cabin. Jack, this 'ere son of 'is, 'e was a long-legged, tired-lookin' sort of youngster, spoke very slow with a drawl, and 'ad brought a cargo of books and such like gear out with 'im, and used to set a-readin' of 'em whenever the old man let 'im. But 'e was a smart officer, though 'e didn't look it quite. I took stock of the youngster as well as I could, and I thought to myself, 'Ah, you may be a gallant lad enough, but you ain't the stuff as V.C.s are made of. You're too slow and steady-goin' for that game. It's the scallywag what gets the V.C., while the other chap's a-thinkin' of it out.'

"We carried on quiet on that station for some months after young Jo, as we always called 'im—though 'is name it was Jack—came out from England. But one day, while we was at our moorin's inside the breakwater in Table Bay, we all noticed that there was some fuss more than usual a-goin' on. The flag-ship was layin' inside of us, and her semáphore 'ad been busy all the mornin' with messages from the shore; the Admiral 'ad gone in in 'is barge, and 'ad come off again, and then a signal was made for Jo to go aboard of the flag-ship. 'E came off at last, lookin' pleased as be blowed, the joy regular a-shinin' out of 'is face. Somethin' was up. Workin' parties was sent ashore, and we shipped extra small-arm ammunition, rocket tubes and war rockets, stretchers, and an enormous number of cases of [illegible] beef and compressed food of all sorts; medical stores also. We 'ad coaled a few days before, and soon after we'd cleared out next mornin' we heard officially that some murderin' black scoundrel of a King of Iseyin, up Benin way, had been a-doin' somethin' 'e oughtn't to, and we was a-goin' to check 'im.

"At last we fetches up at the place as we were bound for, a saloobrious spot called Goolung, or some such name. Off 'ere we found the *Musk Rat* a-waitin' for us, the *Kestrel*, another cruiser of the same class, and a great rusty, wall-sided tramp steamer from Gib. with more stores. A river comes in to the sea at Goolung, and it soon leaked out that we was a-goin' up this river in boats as far as a place—I clean forget the name, but it doesn't matter.

"To make a long story short, we got under way at last. The expedition was commanded by Jo, and, in course, 'e took 'is son along out of the *Musk Rat*. There was about thirty marines, of 'om I was one, and about eighty bluejackets. King, our commander, 'e came with us as second in command, and young Jo was made a sort of edge-du-cong to 'is pa, and follered after the old man.

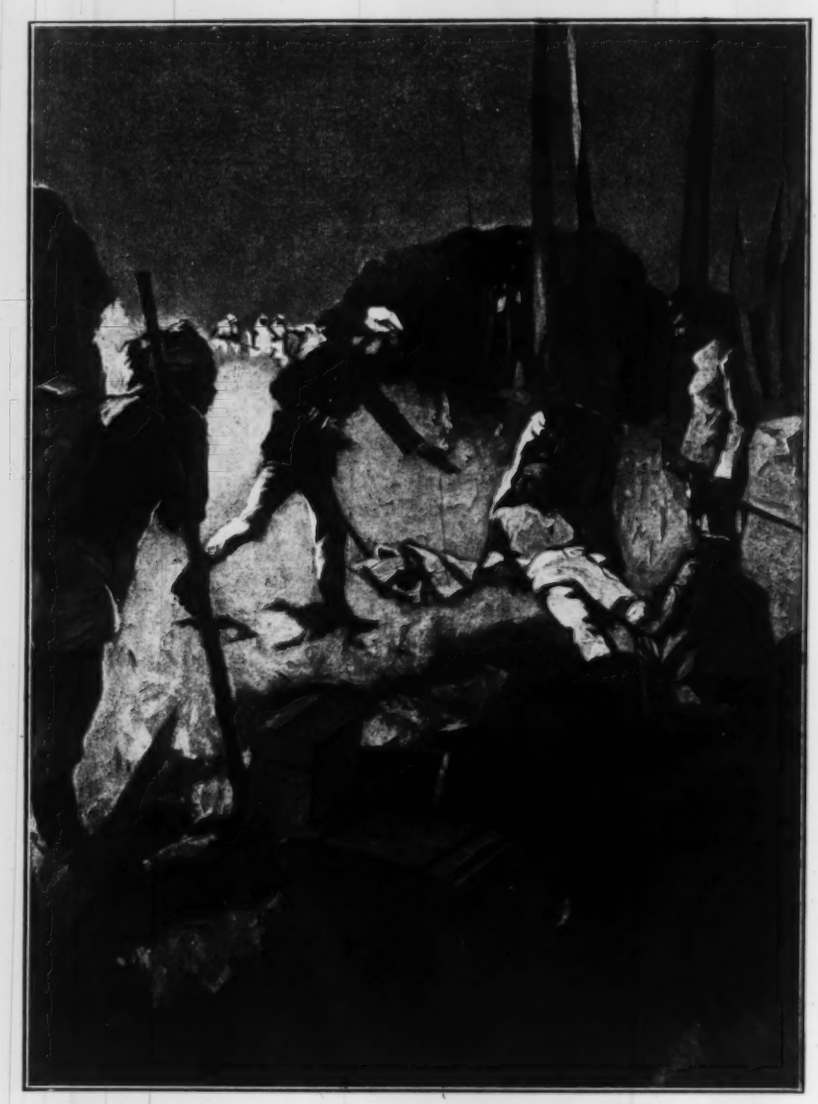
"I don't know really which was the worst, the three days we spent in cutters bein' towed up that foul river, swelterin' in the sun all day, or sweatin' in the clammy mists at night. We got at last to a place of which I misremember the name. At that blarsted vilage we waited for nigh a week till the carriers 'ad been collected—and a dirty lot of niggers they were. Well, one evenin', sir, I accerdentally over'eard a conversation between young Jo and old Jo. I wasn't takin' no notice of what Jo and his lad was a-talkin' about, till I 'eard Jo say somethin' about the V.C., and then I cocked my ears. 'E was a-saying, 'Keep your eyes open for a chance, my lad; you'll never know when it's a-comin', and it'll never come twice, never.' 'I'll do my best,' said young Jo; 'but don't you think it will sound a bit funny, you know, if I'm given the cross on my father's recommendation? Why, wotever I did, supposin' for the sake of argyment that the chance did come and that I took it, supposin' that, why, there'd be plenty to say that it was a family job.' Jo was fair flummoxed. 'E groaned 'orribly to 'imself, and I could 'ear 'im a-swearin' softlike below 'is breath. 'Gawd 'elp us,' 'e said at last. 'But I believe it's true. You must give up all idea of the cross this journey, my lad. I could never 'old up my 'ead if anything like that could be even 'inted at.' Young Jo 'e gave a little larf. 'There is a way out of it,' 'e said, 'though not a way as would be likely to suit you. If you was to go sick, *and* the opportunity came, *and* I took it, why, Commander King, who would be in command, 'e could recommend me, and would too, if 'e got the chance, for King's a good chap, though I know 'e's no pertickler pal of yours, guv'nor.' The old man 'e gave a great sigh, and said: 'I couldn't do it, lad. Out of the bloomin' question,' he says, 'though King is a good chap, as you say. 'E's too much of a soldier for me.'

"Well, we weighed anchor, as Jo would 'ave said, next mornin', and marched off up the bush track to Iseyin. We didn't get on very fast, as you may imagine, but we got on some'ow. The first day nothin' 'appened. The second day the enemy kept a-firin' on the advanced guard from out of the bush. We never saw them, though we used to 'ear them in the bush sometimes, and we found a few dead, as we shot unbeknownst. This sort of thing 'appened pretty frequent in the second day. A few of our men was 'it, but nothin' serious, which was a wonder. The third day, 'owever, was *the* day. Nothin' much 'appened in the mornin'; but shortly after dinner we got down close to a river. The path took

a sudden turn down to it, and when we rounded the turn we found ourselves within a few yards of a bloomin' stockade about six or seven foot 'igh. There was some loop'oles in it, and as our chaps came a-saunterin' round the corner quite unsuspectin', there was a scatterin' fire from these loop'oles, which, fortunately, went 'igh. Our men ran in, and the niggers bolted, and Jackson, a private in the marines, ran round the corner of the stockade after them. There came a sharp crack, quite different from the usual noise of the nigger's guns, and Jackson 'e rolled over like a rabbit, dead as mutton, shot through the 'eart. I was only some twenty paces behind, along of Jo, when this 'appened. "'Old 'ard,' sang out Jo, 'we don't want all you blighters killed,' 'e said, 'we must reconnoitre'; and we all looked at one another, as this was very different from the shootin' we 'ad met with so far. It wasn't no easy matter to reconnoitre, as the loop'oles in the stockade was too 'igh from the ground for us to see through, the niggers 'avin' built a sort of banquette on the far side to fire from. 'Owever, Jo made me give 'im a back, and then 'e could get a squint at the enemy. 'E looked and 'e looked, all the time whistlin' softly to 'isself. Then 'e passed the word for Commander King, and King 'e came 'urryin' up from where 'e 'ad been a-'ustlin' up the rear-guard. When King arrived, Jo turned from the loop'ole, still a-standin' on my back, and explained the sitooation. 'E quite forgot where 'e was a-standin', and I felt myself gettin' redder and redder in the face, and could see the men a-grinnin' to each other. 'King,' 'e said, 'this is serious. There is a steep rocky bank to the other side of the river, with a sort of cave or openin' in the rocks, and the beggars must be 'idden in it.' When 'e 'ad got about as far as this I gave a lurch, bein' a bit off the job by that time, and Jo sudden saw where 'e was a-standin'. "'Ere, let me down,' 'e said, 'and some of you men just build me a stage 'ere to give one a lookout through this 'ere loop'ole.' I straightened up my back, feelin' glad to get rid of Jo's fairy weight, and some of the 'ands set to and soon rigged a platform which a man might stand on and 'ave a squint out at the other side of the river. Jo went on with a description of what 'e 'ad seen. 'The beggars fairly command the crossing from there, and there is no way of gettin' across but by the tree which lies across the stream and makes the bridge.' While he was talkin' young Jo 'e strolled up. 'Beg pardon, sir,' 'e said, quite officiallike, 'I 'ave plan for clearin' them varmint out of that cave.' He went on quite cool: 'I think, sir, as an active chap could easy cross lower down. I notice that there is a tree as 'as fallen partly across the river. Now any seaman could get across there, and go along the river till above the cave in which the niggers are. Then it would be easy enough to drop down to the sort o' platform outside the cave, and, once there, the revolver would do the rest. I wish to volunteer for this 'ere job, sir.' Well, both Jo and King was a bit took aback at this. They looked at each other, and then Jo spoke up. 'Jack, my boy,' 'e said, 'there ain't no call for you to go and chuck away your life for nothin'. Your bloomin' plan is all damn fine; there's only one weak point in it. That is, that as soon as you drop down in front of those there savages, it's they'll do the killin', and not you, my lad.' But young Jo 'e were very determined. 'My plan's the only one,' 'e said again; and 'e took 'is pa away a few yards down the track, and they argued it out by themselves. At last they fell to shakin' 'ands with each other, and King said, 'It's settled, and the youngster's a-goin' to 'ave 'is way'; and so it was. They shook 'ands serious-like two or three times, and then came slowly back to where we was all standin'. Jo looked sadly put out, and kept a-blowin' 'is nose tremenduous, but the lad looked just as usual. 'E turned to where the bluejackets was restin'. 'Now, lads,' 'e said, quite brisk and cheerful, 'I wants six volunteers.' In course every man jack of 'em wanted to be in it; but it was settled at last, and they marched off. In a moment they'd slipped out of our sight in the forest.

"Jo, who stood very quiet and serious, ordered me up on the little platform to keep a sharp lookout through the loop'ole. 'Tell me when you see 'em,' 'e said; 'tell me what they're doin'.' For a little time I saw nothin'. Then I saw them a-swingin' themselves across the river, and I told Jo 'ow they was a-gettin' on. 'Be sure and tell me,' 'e said, 'when they gets on the rock just above the cave.' When they finally reached it, young Jo 'e drew 'is pistol. I told the old man that they was just a-goin' to drop in front of the cave. This was what 'e'd been a-waitin' for, and 'e gave a shout and run out into the open, 'is pistol in 'is 'and. I 'eard the shout, and saw the smoke of the niggers' a-shootin' from the cave come simultaneous, almost at the same moment as young Jo dropped on to the rock at the cave's mouth. I jumped from my perch, and King and me ran after Jo. The blarsted niggers 'ad shot straight as usual. They 'ad floored 'im, and we picked 'im up with three bullets in 'im. 'E was quite conscious. 'It were the only way,' 'e said to King; 'I 'ad to draw their fire. 'Ow's Jack gettin' on?' Jack, in course—the fire of the niggers 'avin' been thus drawn—'ad got on all right. 'E and the lads had rushed into the cave through the smoke of the shots fired at the skipper, and any shootin' there was in the cave was from a Webley revolver. When young Jo came back on our side of the stream 'e ran up quite unsuspectin'. 'Quite a simple job, after all,' 'e shouted, 'but 'ow the 'ell did you draw their fire?' Then 'e saw 'ow serious every one were lookin', and the group round where the skipper were layin', and 'e twigged. Gawd, 'e were knocked out. Jo, 'e squeezed the lad's 'and: 'I got to wind'ard of you, Jack, after all,' 'e whispered.

"Well, in course, the way bein' clear, the column went a'ead, King now bein' in command, and Jo was sent back to the base where we'd disembarked; he were nearly well when we got back. And King 'e did the right thing. In 'is report to the Admiral 'e made a 'ell of a yarn about young Jo a-tacklin' the cave job, and would 'ave made a yarn about Jo too, but Jo insisted on seein' what 'e were goin' to say, and wiped all that part out. The Admiral 'e took it up, and young Jo 'e got the cross, after all; but I think that 'e never would 'ave lived to see it if the old man 'adn't drawn the fire of the cave."



"Then 'e saw . . . . the group round where the skipper were layin', and 'e twigged"

Highland Park Entrance

Pittsburgh, the Giant Industrial City of the World

THEY used to call Pittsburgh the Smoky City; it is smoky yet. They used to call it the Iron City; Steel City would be a better name, for if "Iron is King," the steel throne of His Industrial Highness is in Pittsburgh—if we must use analogies pertaining to royalty — properly there is no place for them in the United States — to illustrate American strength and supremacy. Human labor is our King, which takes form in the Ideal Working-man —the capitalist and manual worker combined.

The capital of this spirit of American genius is Pittsburgh. Of this there can be no reasonable doubt, for Pittsburgh has come to be the industrial centre not only of the United States, but of the world. The greatest giant of modern times, American Commercial Genius, resides there and holds undisputed sway.

No community in the United States is more prosperous just now than Greater Pittsburgh. A cloud by day — the dark smoke of its thousands of furnaces—and a pillar of fire by night—the flames of these same furnaces mark out the path of its progress; and the wilderness has vanished. Not quite 1,000,000 people live and toil in and around Pittsburgh, but its railroad and river commerce exceeds that of London, New York, or Chicago, and surpasses in extent that of the famous Sault Ste. Marie Canal.

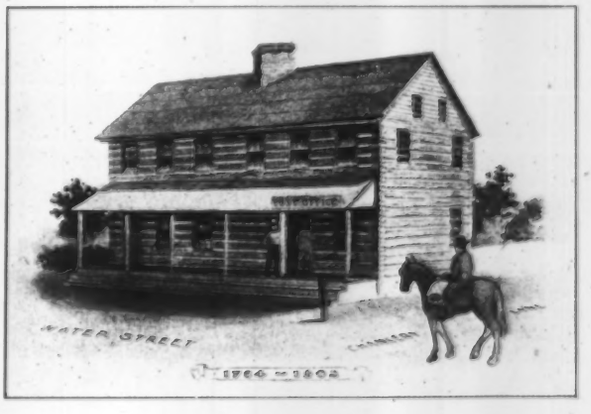
Old Block-House

The reason for this is plain. The Steel Age is upon us. The steel industry has moved westward over the Allegheny Mountains, along the lines of least resistance, and has centred in the one spot in this country where the best fuel may be secured the cheapest, where the iron ore may be brought at the least expense, and where the distribution of the finished products of steel may be accomplished most easily.

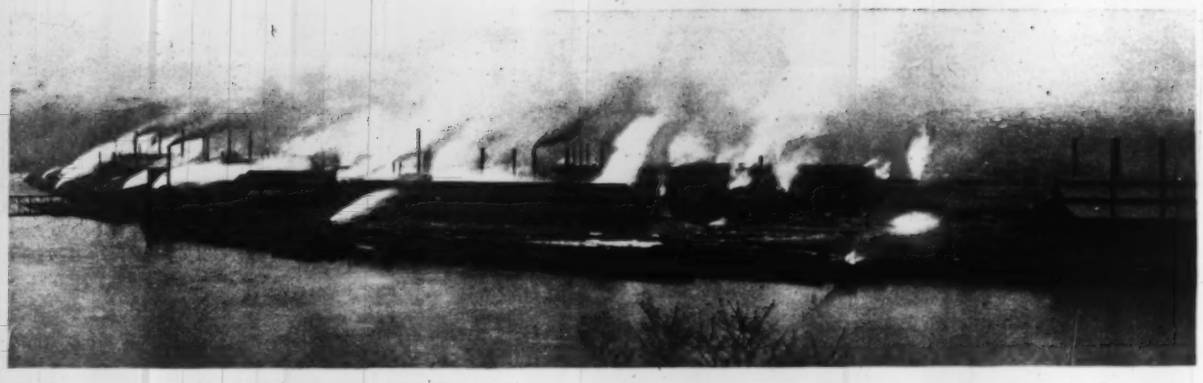
George Washington first marked Pittsburgh as the site of a great town. He saw in its site a commanding position at the head of the Ohio River for commerce and trade. It was its position as a frontier post that attracted him. The possibilities of river traffic appealed to him. The age of steel he did not dream of. If there had been no railroads Pittsburgh would always have been a great city because of its natural position. Washington named his fort at the meeting-place of the Monongahela and Allegheny Fort Pitt, in honor of William Pitt, and the pioneer residents, mainly Scotch and Irish, called the town Pittsburgh, not burg, the corruption of the German *berg*, and now its name is Pittsburgh or Pittsburg, according as one fancies its chartered appellation or the simpler name adopted by the Federal government and most of the corporations doing business there.

Take a rectangular piece of paper, and mark a waving line along the bottom, running, say from east to west. In the centre of the piece of paper draw another waving line at right angles to the bottom one, and running, say, from north to south. The irregular lines represent the rivers that made Pittsburgh what it was and to a large extent what it is. Join the base and altitude of the eastern of the two right-angled triangles formed by the river systems with a hypotheneuse about a mile long, and in the area cut off you have the business part of the present city of Pittsburgh. This part of Pittsburgh is really more like an equilateral triangle. Put the apex where the Monongahela and Allegheny form the Ohio, and let the base extend from river to river. From the apex back nearly to the base the town is level. Then there comes a sharp rise, and on top of this rise, midway between the Allegheny and Monongahela, stands what is probably the finest business building in the world.

With the exception of the hill, the topography of Pittsburgh resembles that of New York from the City Hall to the Battery. Call the main street Fifth Avenue, instead of Broadway, and put all the retail shops, the theatres, and hotels, as well as the wholesale houses and railroad terminals in that district, and you have some idea as to how the city lies. Now, narrow the East River



First Post-Office



Homestead Works

and the Hudson River to streams about 1000 feet wide, and put a score of bridges over them, to South Pittsburgh, on the one side, and to Allegheny on the other, and the river situation may be understood by New-Yorkers. On the Brooklyn side let the bluffs rise to a height of more than 500 feet, great battlements of nature looking down upon the business centre. Then run half a dozen inclined planes up their sides, to accommodate travel, and one can realize what a beautiful view the river traffic must present.

Now fancy the territory north of New York's City Hall stretching away for miles in noble hills, one of them reaching an altitude of nearly 600 feet, with great gullies—gulches almost—between the hills, and imagine this vast extent dotted with beautiful suburban dwellings, and the possibilities of home-building in probably the most attractive series of natural sites in all the United States becomes apparent. Across the Hudson River imagine a town running back into the same kind of hills as stretch eastward from Pittsburgh, and you can realize how Allegheny lies.

Now let the railroads push their ways into town along the bottoms of deep gulches and over some of the lower hills, every railroad cramped for room, and the problem of the congested railroad traffic becomes apparent. Imagine the two rivers, lined on both sides with great smoking furnaces, for a distance of fully twenty miles, and place on the rivers scores of the old-fashioned stern-wheel steamers and enormous fleets of coal-barges, and the picture is nearly unfolded.

Its full beauty is not revealed until the shades of night fall. Let the visitor go up the Castle Shannon inclined plane on the South Side, and feast his eyes. On a hundred hills for miles and miles the lights sparkle. So far above them is the spectator that it looks as if the sky had been inverted, and the landscape had been sprinkled with stars. They twinkle, precisely as they do in the heavens, and they are tinged with colors. The Milky Way runs straight up through the town. Planets glow here and there, and occasionally, through the gloom of the evening haze, there is the suggestion of a crescent. Search-lights on the river boats send their shafts far up the streams until they shimmer off like the tails of comets.

Wood Street

To come back to mundane affairs and to see things as they are the spectator will observe here and there the reflections of enormous furnace fires casting their gleam upon the sky. It seems as if half a dozen conflagrations were raging about the town. But watch! Here is a volcano right on the edge of an American city. The flames burst out, and those who realize that it is simply a blast-furnace casting off iron-ore impurities know that from time to time the lava, in the shape of slag, is being poured off. Then another volcano and another and another breaks forth.

It seems as if the fires of the subterranean regions were bursting through the earth's crust. A roar of charging machinery is in the air. It all means that Pittsburgh's industries never rest. Day and night they go on with thunder and fire and smoke. And the prosperity finally displays itself in the contented appearance of the people, in the modest displays of wealth by scores of millionaires, and in the figures of savings and other banks, such as no other city of its size in the world can present.

THE CROWDED BUSINESS SECTION.

The business part of Pittsburgh is pushed and crowded into a territory entirely inadequate for its volume. The people of the town have insisted upon doing business down in the little triangle. There is not room

Head of Ohio River

enough there for the many lines of street cars. It is a congested place, confined as if by hoops of steel of the place's own forging. Now that the tall office building erected by Mr. Frick has led the business movement up the hill, the tendency is shown to push out further upon the hills and into the valleys. The city can grow no more down toward the angle where the rivers join. The crowds there now jostle and surge and twist to a greater degree than in any place in New York, except at the Brooklyn Bridge entrance. Fifth Avenue of a Saturday night is a sight. The great retail thoroughfare is almost impassable.

It is possible that if the Greater Pittsburgh is created, as would seem to be the logical outcome of the situation, bringing under one municipal management the affairs of fifteen villages and towns roundabout, at present really a physical part of the city, business will feel more free to break its present confines. To a visitor it seems absurd that one cannot cross a bridge to leave the little business triangle without paying toll. And yet such is the fact. The bridges are chartered private corporations, and very profitable. If one walks across any of them

City Hall

he must pay one cent. For every horse that crosses there is a charge of five cents.

And then there is a singular inconsistency that the residents take as a mere matter of course. If you ride across one of the bridges in a street-car you pay no toll. The car lines pay it for the traveller in the shape of royalties for permission to run their cars over these structures. This tax upon the industries of the town, upon the daily walk of its people, has been going on for decades. It is not only provincial and backward, but it is easy to see that it has cramped the growth of the place, and the wonder is that the people have put up with it. When Greater Pittsburgh comes—and it will come when certain difficulties placed in its way by small politicians are overcome—the bridges will be free, and an unnecessary tax upon the vitality of the town will be removed, and the place will grow as it alone can grow, out toward the hill and over the rivers, and Pittsburgh will come into the full possession of its rightful domain.

One needs to dwell little upon the history of Pittsburgh; it is well known to all. It is not known generally, however, that it was not until 1860 that the manufacture of iron was begun on a lasting basis in the place. That business venture has brought wealth and prosperity to that part of Pennsylvania. The names of Carnegie and Jones and Park and others are recalled at once with this marvellous industrial development. And what a splendid monument to American industry they and the others have built up there! In 1800 the population of the place was only 1500. In 1900 it was 321,000 in the city limits, but more than 700,000, including the suburban territory. It is now about 700,000 in the Pittsburgh region proper.

A few facts as to what this stronghold of industrial power really consists of: There are more than 5000 separate industrial establishments in and around Pittsburgh. More than 200,000 workers are employed there. The shipments of freight last year approximated nearly 80,000,000 tons, an unheard-of record in all the world. More than 2,500,000 cars were detailed to care for this traffic. One steel-making establishment brought more iron ore into the region over its private railroad from Lake Erie than the entire traffic of three of the greatest of our transcontinental systems. The capitalization of all the industries amounts, it has been estimated by an authority, George H. Anderson, Secretary of the Pittsburgh Chamber of Commerce, to fully $2,000,000,000. The city holds fifth rank in the financial strength of the country. Mr. James M. Swank, the recognized statistician of the iron and steel trade of the country, declares that the place made more than 38 per cent. of all kinds of steel in the United States in 1901, the latest year for which figures are available. More than 24 per cent. of all the steel rails of the country were made there. More than 60 per cent. of structural shapes were produced there, and more than 32 per cent. of our entire production of rolled iron and steel came from the mills there.

But that is only a part of the industrial power of this community. Forty per cent. of the entire glass production of the country came from the Pittsburgh territory. In the making of white lead the city was in advance of any other place in the United States. In a vast number of industries growing out of the finishing of steel, the place held rank among the first of our cities. It excelled in the manufacture of finished copper. It is one of the greatest cork industrial centres of the land. It has more banks in proportion to its population than any other place in the United States, and that fact alone tells the story of its marvellous prosperity.

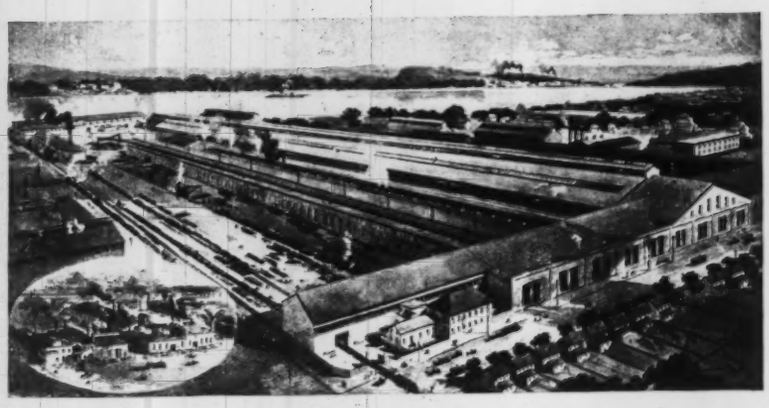
Pittsburgh is almost wholly a business place. Let a visitor express regret that the town is smoky, and the average business man will look up quickly with a challenged expression on his face, and will say, "Yes, it is smoky, but that's what makes the money." And yet there are strong refining influences there. The Carnegie Library, with its art galleries and museums, is the foremost of these, and the fact that Pittsburgh is one of the few places in the country that supports a permanent orchestra tells the story of another profound influence of refining forces at work there. The display of wealth in beautiful homes also has its developing influence upon the masses. There is a popular devotion to outdoor amusement as keen as in any place of the country, the river life in the summer contributing in no small degree to it.

Post-Office

AN UNUSUAL OFFICE BUILDING

It is somewhat singular that with its business territory cramped seriously for room, and taking into consideration that for more than a decade Pittsburgh has been making steel for the tall office buildings of the rest of the country, it has put up such structures for itself only within about three years. There are now nearly a dozen of moderately tall buildings in the town, but within a year two colossal structures, the Frick Building and the Farmers' Deposit Bank Building, have been erected and opened. The bank building is the taller of the two, by a couple of stories, and it is a structure that will compare favorably with any in the land. But the Frick Building of white granite, and lined from top to bottom with beautiful marble, leads in the richness of its finish and the comfort of its appointments

Court-House



Plant of Riter-Conley Manufacturing Company, Pittsburgh, Pennsylvania

any office building in this country. It is severely plain inside and out, but there is no suspicion of the sacrifice of space for money-making purposes. Its halls are wide and imposing, and in the main hall there is a beautiful stained-glass window by La Farge representing Progress. It is the figure of a woman with flowing hair and draperies advancing upon the rolling wheel of progress. Beneath is a magnificent marble seat hewn from the solid stone. That window alone with its inspiring influences is sufficient answer to the assertion that Pittsburgh is a sordid town given up solely to the making of money in a grimy atmosphere. The building in which it is placed is a living monument to the man who erected it, and an object-lesson in architecture for the entire country.

PITTSBURGH'S STRENGTH OF STEEL

It is common to refer to Pittsburgh as a one-industry town. The designation is practically true, and for that reason the town is prosperous when good times prevail, and hard hit when dull times in the steel trade come. But the meaning of the steel trade to the city is of deeper significance. The condition of the steel trade has come to be a barometer of commercial progress for the United States, and when prosperity rules it means that Pittsburgh is probably more prosperous than any other place in the country. Just a few words from *The Bulletin*, published by the American Iron and Steel Association, will reveal what the steel business, especially of Pittsburgh, means commercially to the city. In the review of the trade, published on last Christmas day, and giving the figures for the previous year, this summary is made:

In 1901 Pennsylvania made 46.2 per cent. of the country's total production of pig iron in that year; 49.2 per cent. of the Bessemer steel; 77.2 per cent. of the open-hearth steel; 71.9 per cent. of the crucible steel; 48.9 per cent. of the Bessemer steel rails; 91.4 per cent. of the structural shapes; 69.7 per cent. of the plates and sheets; 28.3 per cent. of the wire rods; and 56.4 per cent. of all rolled iron and steel products.

In 1901 Allegheny County made 50.3 per cent. of all the pig iron that was made in Pennsylvania in that year; 67.2 per cent. of the Bessemer steel; 61.2 per cent. of the open-hearth steel; 74.9 per cent. of the crucible steel; 50.6 per cent. of the Bessemer steel rails; 66.7 per cent. of the structural shapes; 54.1 per cent. of the plates and sheets; 59.4 per cent. of all other rolled products; and 57.4 of the total production of rolled products.

In 1901 Allegheny County made over 23 per cent. of the total production of pig iron in the whole country; over 33 per cent. of the Bessemer steel; over 47 per cent. of the open-hearth steel; almost 57 per cent. of the crucible steel; over 38 per cent. of the total production of all kinds of steel; over 24 per cent. of the total production of all kinds of rails; over 60 per cent. of the total production of structural shapes; and over 32 per cent. of the total production of all kinds of rolled iron and steel.

A few figures from another accurate set of statistics will emphasize the meaning of this summary of the greatest industry in the United States. The census report for 1900 shows that, all told, there were in Pittsburgh proper about fifty establishments engaged in the various forms of iron and steel work, employing a capital of nearly $90,000,000, employing nearly 25,000 men, paying about $15,000,000 in wages to these workers, and producing more than $90,000,000 worth of finished product. Double these figures for the entire territory tributary to the town, and then increase them by fully one-third, to allow for the great strides in the industry since 1899, and you have some idea of what the industry means in a financial way at present to Pittsburgh.

Frick Building

It means that probably $250,000,000 of finished steel a year is being produced there now, and that more than $40,000,000 is being paid to the wage-earners in that industry. It is difficult to conceive fully what this means to the town, to its banking and other interests. One can realize why it is that no less than $181,000,000 is being expended, according to an estimate made on March 22 last by the conservative Pittsburgh *Post*, to cover a period of four years, in extending the railroad and other business enterprises of the town. The railroads are spending no less than $50,000,000 in improvements east and west of the town, and the rest is being spent largely by the steel and electrical companies in making betterments. New mill buildings, some of them nearly a quarter of a mile long, are being erected, and new machinery, to save labor and produce better products in the metal output of all kinds, is being brought in almost every day.

It is related that a foreign traveller approaching Chicago said to the porter of a sleeping-car, as he looked with alarm toward a great smudge of black smoke in the Chicago, "What's that?" "That, sah," said the porter, "is Chicago." The same might be said of Pittsburgh, but it should be added that the smudge is a sign by which the city conquers. Long before the traveller reaches town he sees enormous clusters of towering smoke-stacks belching vast quantities of black smoke into the air. The very trees show the deadly effect of this, for the older varieties of the deciduous trees are dying off under the fumes. Then the visitor observes enormous tank-like shapes of red-painted steel. These are the blast-furnaces where the ore is melted in flux, and the first cooking of the product is made. If one reaches the town in the evening, for miles and miles as he comes in, upon hillsides and in valleys, he sees acres upon acres of fiery furnaces blazing at the tops and sides, giving a startling effect to one who looks on them for the first time. These make the coke for the steel furnaces.

But it is not until one goes through one of these steel-making plants that he realizes what they mean, and that it begins to dawn upon him that right here in these wonderful places the forces are

Plant of A. M. Byers & Co. (Incorporated), Pittsburgh, Pennsylvania

put into play that have developed our railroads, that have reconstructed our great cities, and transformed their buildings, that have made it possible for us to assert our national strength in the upbuilding of a navy, and that into this industry there enters the highest skill of the chemist, the largest courage of the capitalist and manufacturer, as well as the brawn of the highest developed form of the American working-man. A steel plant a mile long is the ordinary thing in these days. Scores of great sheds and mammoth furnaces are in use. A network of railroad tracks fills each place. A roar like Niagara's smites the ears. The crashing of man-made thunder is in the air. Enormous tools toss about the great blocks of red-hot steel as easily as a hod-carrier picks up bricks.

STEEL WORKS BRILLIANT AT NIGHT

To see a steel plant in its full glory (glory seems to be the proper word) of its strength, one should visit it at night. There is one of the leading ones in the industry directly opposite the heart of the business district of Pittsburgh, and within twenty minutes' ride. Let us visit it, and take a superficial view, as we pass from building to building. Across a bridge from the Pittsburgh side a locomotive comes puffing briskly, drawing a train of immense ladles of molten steel from the blast-furnaces where it has been cooked nearly into its proper condition. The train stops on an elevated structure, the word is passed, and slowly each ladle is tipped over. A great stream of red-molten metal runs into a furnace-like affair called a mixer. There certain chemical ingredients have been placed to further purify the metal, and then the work of finally purifying it by intense fires begin. We are now ready to observe the work of the last stage in boiling this molten mass. Another pouring occurs into the great open-hearth furnaces and Bessemer stacks. This Bessemer furnace is the most spectacular manufacturing thing in the world. After the molten steel is poured into it a blast of compressed air is discharged into it, and a great flame leaps out of the top, throwing out sparks that make pinwheels and other fireworks of fascinating shapes. The furnace snorts and roars under the pressure of four big air-compressors, and the vast sheet of flame, turned toward the sky at an angle of forty-five degrees, smites the air with a massive torch fully fifty feet long. The flame is of a deep yellow color. Gradually it turns to a lighter shade, and then as it turns to a still lighter color and the fireworks seem to die away, the skilled workman in charge knows exactly when to stop the blast. The metal is purified and ready to be cast into ingots.

Before the casting occurs turn to another structure about fifty or sixty feet long and probably twenty feet high. It is an open-hearth furnace known as the Talbot variety. It looks like the battery part of a battleship. It weighs hundreds of tons, and there are curved runners or grooves on its sides by which it is tipped over as easily as a child tips a rocking-horse. The molten metal is poured from the mixer into this, just as it is poured into the Bessemer furnace. Before the metal is run, the furnace is "charged." That is to say, certain quantities of chemicals are thrust in it to assist in the purification of the metal. This charging contrivance at first sight seems like a flying-machine with a long prow thrust out in front. The operator sits up in the machine with a lot of levers, and, as it runs along an elevated frame, swings the ponderous affair this way and that, up and down, sideways, and forward and back until he looks in the gloom as if he were flying in the air. The long prow is thrust into a trough-like affair, and then the trough, filled with proper chemical ingredients, is carried to the back door of the furnace, and thrust into the blazing fires. Then, as in the Bessemer furnace, the molten metal flows limpidly into the top with a glittering show of fireworks, and the cooking of the steel goes on.

The skilled operator, using blue glasses because of the intense light, looks into the furnace from time to time, and when the color is just right knows that the dish is done. Then, with the use of hydraulic power, the great furnace is tipped over, and the steel is ready for its ingot shape. Whether it comes from open-hearth furnaces

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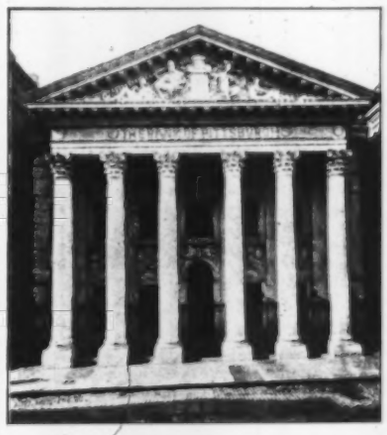

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Christ Methodist Episcopal Church

or from the Bessemer furnaces, the operation is now the same. Cast-steel moulds, each standing on a little railroad-truck of its own, are rolled under the furnaces, and with much spluttering the cooked steel is run into them one by one. These moulds look to be about eight feet tall, with a width and a depth of about two feet. As soon as the metal is poured into them they are dragged away. The outside of the moulds soon assmue a cherry-red color, as the molten metal hardens.

After about half an hour the moulds are run under a machine called a stripper. It looks like a crab. It has two enormous claws and a blunt nose. The blunt nose is pushed down upon the semi-hardened metal, to hold it firmly upon the bottom of the little car, and then the claws come down and grasp the sides of the mould and lift it clear of the ingot, leaving a beautiful pillar of fire standing solidified and almost terrifying in its aspect in the deep gloom of the place. Here comes another demon contrivance. It seizes the glowing ingot, which is still in a molten condition inside, and takes it away, and, with tossing and tugging, places it in a brisk fire called a "soaking pit." It is simply a fiery furnace where the ingot is reheated, the molecules being distributed evenly thereby.

FLATTENING THE INGOTS

From the soaking pit the ingot is hauled out with scant ceremony, and then comes the most exciting time of its career. It is mauled and pummelled into new shapes almost at the hour of its birth. Electrical devices toss it on a frame-work of rolling cylinders, and now a mad race begins. The rollers hurry it forward to a machine where it passes through immense rolls that flatten and elongate it. Through the rolls it goes with an awful protest and flinging out of the scale that has gathered on its surface as it has cooled somewhat. Out on the other side it goes. A man throws a lever, and the rolls which have received it are tipped up, and it goes through the crushing process again at a higher elevation. The first table of rolls has now been elevated to receive it again. When it comes back to its first starting-point it is a new piece of glowing steel. Down goes the table, and through the jamming-machine it goes once more, the opening through which it has passed once being made smaller. Still more groaning and more roaring follow, and back and forth the ingot is hustled until it is so small that it may be transferred to other mills to be rolled into rails, or bars, or structural shapes or rods.

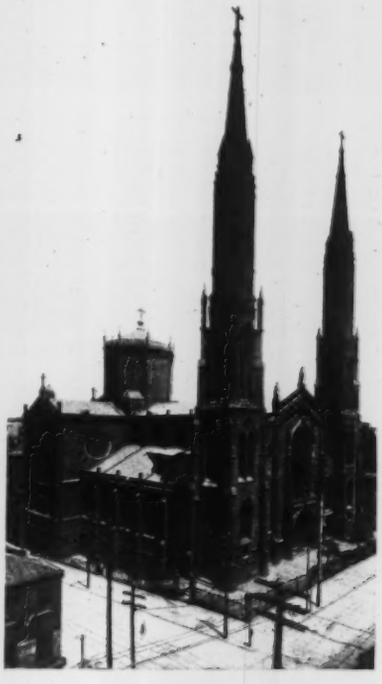
Suppose the ingot is to be made into rods. It is elongated to about twenty-five feet, and then it goes on another tour. It looks like a snake. A stalwart working-man seizes it by the head with a pair of tongs and thrusts it into the rolls. Thinner and thinner it becomes as it passes from one set of rolls to another, squirming and quivering its entire length. The workmen pounce on it here and there, and send it this way and that. The glowing steel protests, but as it passes from one machine to another these protests become fainter and fainter, until at last its tail is thrown with a defiant but conquered fling far into the air, and the scotched snake runs out a red steel rod, hundreds of feet long, upon a series of frames where it is cooled and where, as it becomes dark, it is cut up into lengths suitable for loading on railroad-cars. It is still hot, but the life of the fire is ebbing and soon is dead.

The same general process is used in finishing the various forms of steel product. One of the sights, even more spectacular than the making of rods, is to be seen in the great rail-mills at Braddock, where, with almost lightning rapidity, the great steel shapes are tossed about and squeezed into proper forms. Up at Homestead the visitor will see a plant where the handling of the ingots is reduced to a still greater science by the most expensive machinery that can be contrived. One will see a machine mauling the ingots about and with the aid of four or five men doing the work that required the labor of nearly one hundred men ten years ago.

It is this perfection of labor-saving devices that has largely reduced the cost of steel. It takes great courage to put your profits into new machinery, but that is what Mr. Carnegie and the others did a decade a year ago. And the result was that this country took the lead in steel-making. The further result has been the enormous increase in the use of steel, and the masses, who have profited by it, have scarcely realized the debt that the country owes to those men who were not afraid and who foresaw the future so important to us all.

When one realizes that the cost of finished steel is about $30 a ton, and that millions upon millions of tons are made right here in this district—nearly two-thirds of Pennsylvania's entire product—he begins to understand the importance of the industry. The Bessemer process of making this metal seems to have run its course. The increase in this form of product is only slight comparatively each year. The open-hearth

(Continued on page 847.)



Cathedral

Peoples' Savings Bank Building, Pittsburgh, Pa.

Development of the Savings-Bank Business

LIKE every other line of business, that of the savings-banks has undergone important change and development during the past few years.

Instead of being dependent upon local patronage, as was formerly the case, they are now reaching out to, and securing business from, all parts of the globe.

"Banking by Mail" had its first start quite a number of years ago, when a few Pittsburghers moved away from the city, leaving their savings-accounts behind.

By special arrangements the Peoples' Savings Bank allowed them to send deposits by mail. New accounts began to come in in the same way, and from this early beginning a department of banking, that is entirely distinctive, has developed, until now it reaches out into every nook and corner of the civilized world.

Recognizing the possibilities of this larger field, the Peoples' Savings Bank began to advertise for mail accounts, with such encouraging results that about a year ago it entered the national field.

As a direct result of this advertising, it has opened accounts with men and women in every State and nearly every foreign country.

But the management of the Peoples' Savings Bank, while always progressive, has been careful and conservative—absolute safety being always the first consideration. A list of officers and trustees—men who have long been prominently identified with the financial and commercial interests of Western Pennsylvania—follows:

D. McK. Lloyd.....President.
Thomas Wightman ..... Vice-President.
Edward E. Duff.....Secretary and Treasurer.
James K. Duff...Ass't Secretary and Treasurer.
Sidney F. Murphy.....Auditor.
Charles W. Kiser....Manager Mortgage Dep't.

TRUSTEES

D. McK. Lloyd. — A. E. W. Painter.
Thomas Wightman. — George W. Crawford.
Hon. Edwin H. Stowe. — Wm. R. Thompson.
W. J. Moorehead. — Robert Wardrop.
Edward E. Duff.

The bank has a capital of $300,000, surplus and profits of $515,000, and total assets of over $10,000,000.

It accepts deposits in any amount from $1 up, and allows interest at the rate of four per cent., compounded every six months.

Its new quarters in the Peoples' Savings Bank Building, Fourth Avenue and Wood Street, are among the handsomest and most conveniently arranged banking-rooms in the country.

Glass Plant, Jeannette

(Continued from page 846.)

process is fast superseding it. This process is more expensive, but the steel seems to be better adapted for general work than the other kinds, and few new Bessemer furnaces are being put in nowadays.

EQUIPMENT OF A MODERN PLANT

In the *Engineering Magazine* for January, 1901, Charles M. Schwab, now president of the United States Steel Corporation, wrote of the equipment of a modern steel plant, using the Carnegie company as an example. The modern steel company owns its raw material, and does all its own work in the finishing of the steel. This saves a large number of intermediate profits, and the result is that the public reaps most of the benefit. For instance, the Carnegie company at that time had a system which included the mining of iron ore near Lake Superior, the transportation of the ore to boats on the lake, the further transportation of hundreds of miles to the company's own port on Lake Erie, Conneaut Harbor, the rehandling of the ore and its despatch for less than a distance of 200 miles to Pittsburgh. Then there was purchased a great industry of coke-making at Connellsville, Pennsylvania, which means the mining of coal and its transformation by the furnaces into coke. Then came the making of the steel proper.

All this mining, transportation, and manufacture means the employment of a great number of labor-saving devices which have cheapened steel. For example, at Conneaut Harbor in 1901 nine ships could be docked at the same time; 25,000 tons of ore could be handled in ten hours; a 6000-ton steamship could be unloaded in fourteen hours, and in another fourteen hours the ore could be at the Pittsburgh furnaces. A train of forty ore-cars could be loaded in two hours. Now apply the system that is displayed in this transportation problem to all the other great departments, and one realizes something of the enormous work of a steel plant.

In 1901 Mr. Schwab wrote that the Carnegie company operated 13,000 miles of railroad track, used 1500 locomotives, and gave employment to about 50,000 persons, paying out to its employees fully $50,000,000 a year. Of course these figures have been increased largely. Now the Carnegie Company is simply a part of the Steel Corporation, and by studying these figures for a constituent company of the greater corporation it becomes evident what an enormous concern the so-called Steel Trust is.

Speaking of the policy adopted by Mr. Carnegie, the railroad superintendent who resigned the munificent salary of $1750 a year in 1865, and borrowed $1250 to go into the steel business, Mr. Schwab says:

"He has willingly allowed the profits of the business to be taken year after year for experiment and improvement, whilst our friends across the water, content with the crude system of by-gone times, took the dividends, and kept the even tenor of their way. The corollary of this, reduced to figures, shows that the United States in 1900 produced 39.25 per cent., Germany and Luxembourg 23.20 per cent., Great Britain 18.44 per cent., and the Carnegie works 10 per cent. of the whole steel product of the world."

In Mr. Carnegie's active connection of thirty-six years with the steel business, Mr. Schwab estimates that America's great Iron King made no less than 50,000,000 tons of steel for various uses, a record probably unsurpassed in the world.

Farmers' Deposit National Bank

BANKING, AND OTHER BUSINESS INTERESTS

Let not the mistake be made that practically all there is to Pittsburgh as a business place lies within the confines of the iron and steel industry. In the entirety of its industries it is one of the notable cities of the world. As a banking centre it is remarkable, and one of the boasts the town makes is that it no longer has to come to New York to finance its ordinary business undertakings.

Nothing tells the tale of a city's business strength like the figures of bank clearings. Ultimately all business of importance centres in the banks. The reports of the Pittsburgh Clearing-House show that in 1899 the clearings amounted to $355,000,000; 1900, $480,000,000; 1901, $496,000,000; 1902, $559,000,000. It is expected that for this year they will reach nearly $700,000,000. All this means that Pittsburgh within five years has practically doubled the amount of its business operations, a record not equalled by any other city in the country, and revealing, as nothing else can, the unwonted prosperity that exists in the town.

Take another indication of business

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Charter perpetual. Capital $2,000,000.
(A surplus of $3,000,000 now being paid in.)
Undivided profits (earned), $1,079,655.47.

Acts in all fiduciary capacities known to law.
Safe-Deposit Vaults.

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ESTABLISHED 1863

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Members New York and Pittsburgh Stock Exchanges

Private wires to all leading points

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"Bringing Life's discords into perfect tune"

strength. The Stock Exchange, which opened for business in 1894 with a record of 75,000 shares of stock sold and $304,000 worth of bonds exchanged for the year, showed these figures for the last four years: number of shares of stock sold in 1899, 2,410,000; 1900, 3,022,000; 1901, 6,341,000; 1902, 4,355,000.

Go back again to the census figures for 1900, which should be increased from thirty to forty per cent. for the present day, to get other data, the most trustworthy that can be produced, as to Pittsburgh's business interests, using the data for Allegheny County, for that means Greater Pittsburgh. In 1899 there were 4145 business establishments in the county, with a capital of $401,000,000, paying for salaries and wages nearly $70,000,000, and employing nearly 130,000 men, women, and children. The output of their labor reached the sum of $433,000,000.

Looking at the figures for Pittsburgh proper—many of the great industries are just outside the city limits—we find this showing as to industries: There were nearly fifty establishments engaged in iron and steel making, using a capital of $80,000,000, employing 25,000 men and boys, and giving an output of $90,000,000. In the making of electric apparatus and supplies the capital invested amounted to $16,000,000, employing more than 5000 persons (a figure now increased by fifty per cent.), and having an output of $14,000,000. In machine products the capital employed was $15,000,000, the workers numbered 6200, and the output was valued at $15,500,000. In architectural and ornamental ironwork the output was $6,111,000. Marble and stonework had an output of $3,200,000, and the value of the masonry done was $3,000,000. A dozen or more industries, such as are found in every large city, had outputs of more than $1,000,000.

Pittsburgh, of course, is the second city in Pennsylvania in manufacturing rank, but within the confines of its territory and practically part of it are the third and fourth cities in rank, Allegheny and McKeesport. For example, McKeesport produced in 1899 $15,000,000 of iron and steel. Allegheny made more than $7,000,000 of the same product. Then there were the smaller places in the district, Braddock, Duquesne, Homestead, and a dozen others, all bringing the record of Greater Pittsburgh to a still higher figure, but not included directly in the census reports.

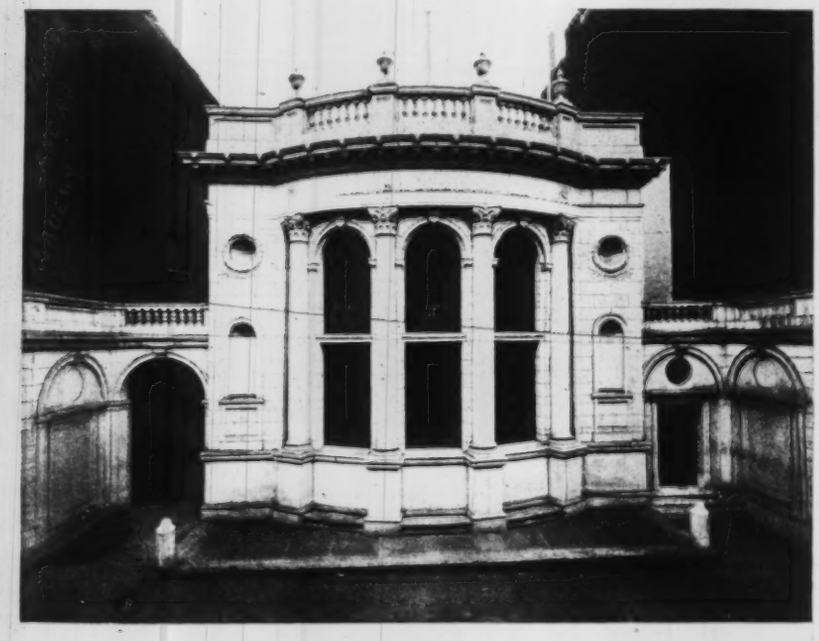
BUSINESS OF THE BANKS

These figures are cumulative, and all are emphasized in the Pittsburgh bank reports, giving the city exceptional rank in the matter of banking. In looking into the bank situation we find that in February last there were in Pittsburgh thirty-five national banks, twenty-six State banks, and twenty-two trust companies, a total of eighty-three. In Allegheny, across the river, there were ten banks of various kinds, bringing the total up to ninety-three. Each of the smaller towns has its banks, so that the record runs beyond a hundred of these institutions.

Now for some more statistics in brief form. The capital of the national banks of Pittsburgh proper was more than $20,000,000; State banks, which means savings-banks, $4,500,000; trust companies, $16,750,000. The capital of the Allegheny banks was $3,225,000. The surplus and profits of the national banks amounted to $26,600,000, of the savings-banks to $6,000,000, of the trust companies to $20,000,000. The deposits of the national banks of Pittsburgh reached $133,680,000, of the savings-banks (here is where the American working-man comes in) $72,000,000; of the trust companies, $62,000,000, a total of about $268,000,000. That amounts to nearly $1000 for each inhabitant, a wonderfully high average, but, of course, the bank figures include the business of practically the entire territory, which would reduce the average to about $300, using the figures 850,000 for the population—still a wonderful average.

One of the interesting things in Pittsburgh banking is the keen competition to secure deposits. The business has become so profitable that the banks scarcely have sufficient daily balances to do business with and keep within the law's limit. The business is so securely founded that such things as bank runs are not feared, and the money goes out in investments almost as fast as it comes in. Many of the national banks pay two per cent. interest on daily deposits. The savings-banks, with one or two exceptions, pay four per cent. interest. Loans are made at six per cent. interest, and in the present state of prosperity of the town the security is of the best, and loaning money at a profit of from two to two and a half per cent. is profitable in the extreme. The stock of one of the trust companies, the Union, sold recently as high as $3000 a share.

Another tendency in Pittsburgh banking is strongly toward consolidation. Within a few months in three cases one or more national banks have been united, each with a trust company and a savings-bank. Economy of administration, greater facility of arranging loans and of financing large operations are secured in this way. The financial authorities of the town declare that all these operations are safeguarded thoroughly, and that the consolidation reveals simply one of the tendencies of the times.



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BANKING BY MAIL

Out of the competition for depositors there has developed in Pittsburgh a new departure in savings-bank management. It is known as Banking by Mail. Most of the savings-banks are stock corporations, and the desire, of course, is to get the largest returns, consistent with safety and strict adherence to the State banking laws. The competition has led not only to the establishment of an unusually large number of savings-banks and trust companies, but has called out a large amount of advertising in the newspapers by the savings-banks.

It is felt by banking institutions in other communities that this plan of generous advertising for deposits is not what might be called "strictly professional," to use a common phrase. The Pittsburgh men point to the New York newspapers and those of other great cities, where the trust companies advertise regularly, and they go a step further. They say that making money by banking is just as legitimate as making money by selling dry goods or any other commodity. If they can increase their business and their profits in that way they say that fact justifies the modern business methods employed. They point to their returns as evidence of the wisdom of the plan.

Well, Banking by Mail is the direct outcome of the advertising by savings-banks of Pittsburgh, a system that has just been adopted by a bank in Cleveland, and by two besides the one that started it in Pittsburgh. It simply consists of advertising that deposits will be received by mail, and that drafts on deposits will be honored by mail, just as if the functions of banking were attended to in person at the bank's office. The man in a suburban or distant place writes to the bank that has advertised, and says he has a certain sum to deposit. He is instructed by mail how to send it. A signature card is forwarded to him, which he fills up, and that is sent with the deposit. The card system of signatures is followed by the banks in Pittsburgh, and the card of the mail depositor is filed away with the cards of the personal depositors. Money may be drawn, after it has been arranged for by correspondence and after the necessary blanks are filled up.

The bankers who have adopted this system of getting deposits from out of town say it is just as simple as caring for business brought into the bank in person. The returns from the advertisements were slow at first. Within three months, however, it was plain that it would be a success. Within another three months it had reached a profitable basis, and now those concerned assert that it is an established system. It has been found that the accounts average $300. The deposits have been as high as $10,000. To the leading bank in this work in Pittsburgh there have come deposits from every civilized nation on the globe. American missionaries in half-civilized lands have sent their money. American residents in foreign countries have responded liberally. From Porto Rico, Alaska, the Philippines, Australia, China, India, the deposits have come. Every country in Europe and every State in the Union is represented in these deposits. Fully fifty inquiries a day are received by the bank in question. The time of a special clerk is taken up wholly with answering queries and attending to the business that has come. The farmers in roundabout towns, where the banks are small and where the sense of security is not so strong as is the case with banks in large cities, have responded liberally to the call for this kind of deposits, and the system is now attracting the widespread interest of bankers all over the country. It is looked upon as the newest form of profitable banking on safe lines.

Mr. E. E. Duff, one of the bankers actively concerned in this system, says of its operation:

"Previous to the development of the banking-by-mail system, it was necessary for a farmer or a resident of a country town to put his deposits in the country bank, or else make a long trip to the city, or keep his money in the house. There is no safety attached to keeping money in the house. Frequently a country bank does not inspire confidence, and it becomes necessary for the owner of the money to spend a day in travelling to the nearest large town or city where he can find a bank that inspires him with confidence. The banking-by-mail system does away with this inconvenience and insecurity."

Reference has been made to the growth of the Stock Exchange in Pittsburgh as indicative of the town's business strength. The history of the exchange presents an interesting series of changes. It is the outgrowth of the Pittsburgh Petroleum Association, which was established in 1866 to deal with speculation in oil-well shares. In a few years this institution was succeeded by the Pittsburgh Oil Exchange. In the early eighties this in turn was succeeded by the Petroleum, Stock, and Metal Exchange. This was succeeded on April 1, 1894, by the present Stock Exchange, which was not incorporated, however, until July 25, 1896.

The Stock Exchange started off with 100 members, and the price of seats, or membership, was $100. In October, 1902, it was resolved to increase the membership by thirty. The price of seats had grown to $10,000 each, and at private sales since they have gone much higher. This rise in value in less than ten years has been phenomenal. With the $300,000 secured by the sale of new seats and with $25,000 added, the Stock Exchange purchased the Mechanics National Bank Building, a beautiful white marble structure of two stories, and has just moved into it. It stands, curiously enough, on the site of the old United States Bank which felt the wrath of Andrew Jackson.

THE BANKING DISTRICT

Pittsburgh has its financial district, as pronounced in its way as that of New York. It is as much localized as any business district in the metropolis. Fourth Avenue is the bankers' street, just as much as Fifth Avenue is the great shopping street. New York's banks, and the banks of any large city for that matter, are scattered well over town. Pittsburgh has banks here and there in its business district, but most of them are on Fourth Avenue, where they lie snug,

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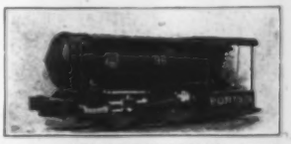

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one up against another, just as the wholesale houses in the dry-goods trade do in New York city.

For two or three blocks every business place on Fourth Avenue of any pretensions is a bank of some kind. It is really an amazing sight, and wonder fixes itself upon the visitor how they can possibly be supported. No such array of banks is to be found in close proximity in any other place in the country. Of course, the fact that they have huddled together is due chiefly to the congested character of the business district of the place. The banks are needed for the town, so prosperous has it been, and there was no other place for them to go than in a small district as close as possible to the chief business street of the place. From a financial point of view Fourth Avenue is the leading street of the town. It makes a brave show, and the presence of so many monied institutions in one spot gives an appearance of aggressive solidity, such as cannot be found elsewhere in the United States. The banks of the Wall Street district of New York, scattered here and there, as they are, are not more impressive than the showing Pittsburgh makes in this field.

Since the beginning of the year record prices in the sale of real estate in the business part of Pittsburgh have been made in half a dozen cases. On Smithfield Street, the second of the leading thoroughfares of the town, as high as $3000 a front foot has been paid, a large figure for a town of less than 400,000 inhabitants. Out in the residence district, where there is a large amount of undeveloped property, as high as $500 a front foot has been paid this year for residential property. Indeed, real estate is soaring in every part of the town, and it is no wonder when one considers the magnitude of the business interests of the crowded city.

Besides the great railroad systems of the Pennsylvania, the Baltimore and Ohio, the Vanderbilt lines, the Pittsburgh and Lake Erie, the Wabash line is now entering the congested business district, by tunnelling through the Mount Washington hills, up which the inclined planes run, and then crossing the Monongahela close to what might be called the "Battery" part of town. This means a great increase in the railroad activities of the place. It is difficult to see how Pittsburgh can be made more of a railroad centre, because of the simple fact that there would seem to be no more room for tracks to enter the place. Every low hill and valley is already occupied by these corporations.

PITTSBURGH'S ENORMOUS CAR SERVICE

To illustrate further the extent of the business activity of Pittsburgh one should study the reports of the various car service associations of the United States. There are thirty-eight of these in the United States, and Pittsburgh's leads them all. It was at Pittsburgh that the greatest freight blockade of the country occurred in the fall of 1902 and the winter following. It seemed as if the tracks of Pittsburgh could never be cleared. The lack of cars for its own industries seriously crippled the town. The trouble came from the fact that Eastern railroads could deliver cars to Pittsburgh for the West, but the West could not take them. "Take loaded cars from us, but do not send us any more," the officials of the roads west of Pittsburgh said. For miles and miles these cars were sidetracked, in and near town, resulting in losses of, one might say, millions of dollars to shippers. Railroad officials hurried to the place. Employees of railroads worked overtime and until they were exhausted physically. Passenger-engines and the crews of passenger-trains were impressed into the service, and early in the year the traffic emerged from the woods, so to speak.

The car traffic associations of the country deal with the car situation after the cars have been delivered to sidings for unloading. It is the business of these associations to keep track of the cars, and see that they are unloaded and loaded within specified time limits. Take the record of Pittsburgh for January of three years. In 1901 the Pittsburgh Association handled no less than 139,762 cars. The next highest record was that of the New England Association, which, for the entire territory of New England, handled 133,364 cars. The Philadelphia Association came next with a record of 121,287 cars. The New York and New Jersey Association handled only 52,300 cars. Chicago's record was 119,215 cars.

The next year Pittsburgh's record was 147,205 cars. New England for that month of January handled 141,891 cars, Philadelphia handled 127,147 cars, and Chicago handled 121,619. In January of 1903 Pittsburgh handled, at the height of the freight blockade, 150,586 cars for the month. New England surpassed this record, handling 155,490 cars. The entire State of Illinois, excluding the Chicago district, made a still higher record, the figures being 219,131 cars. But the point is that no city in the country approached the record of Pittsburgh. The total number of cars handled by this association in 1902 was 1,892,777. Taking the standard length of a railroad-car as a basis, it is believed that more than 200,000 miles of freight-cars were handled in one year on sidings of the town. Can anything be more impressive than that?

THE RIVER'S GREAT COMMERCE

Another set of figures, showing the commerce of the rivers of the city, will be sufficient to convince the reader of the vast importance of this commercial centre of the United States. Six or eight miles below Pittsburgh on the Ohio River is the well-known Davis Island Dam. River dams are common in and near Pittsburgh. They are situated several miles apart, in most cases, and they back the water up into deep lakes which are called pools. These pools often get crowded with many square miles of coal-boats waiting for high water, so as to carry their product down the Ohio and into the vast tributary district of the Mississippi and the Gulf.

The government records show that the tonnage of the rivers in Pittsburgh Harbor for the year 1901, the latest for which figures are available, was 10,916,489. The tonnage of the harbor of New York for that year was 16,797,700. The tonnage of the "Soo" canals, the greatest in the world, was 30,000,000 tons. Going down the Ohio past Davis Island Dam, the tonnage was 3,340,000. Going up it was only 61,700 tons, showing what the coal-traffic shipments of Pittsburgh amount by water. The number of vessels approximately that passed the Davis Island Dam in the year was more than 15,000. The number of passengers carried was 817,500. On the Monongahela, right in Pittsburgh, so to speak, the tonnage of the river, as shown by the records of the nine locks, forming pools there, was 9,100,000, and the number of passengers carried was 181,000. The nearest record to that before was in the year 1899, when the freight tonnage was 6,954,000. Wonderful, indeed, is the business of Pittsburgh and its port.

USE OF NATURAL GAS

This subject of fuel in the Pittsburgh district should not be dismissed without a word or two on the use of natural gas. In the late eighties and early nineties there was a prodigal waste of this product in Pittsburgh. It was in the ten years of this time that the coal industry received the only check in its growth in the district. Natural gas is still in general use in manufacturing and the heating of households of the city. Many of the fields have been exhausted, and most of the gas now used comes from what is known as the West Virginia region in great pipe-lines. It is almost indispensable in glass-making and in the open-hearth system of steel manufacture. Indeed, some of the steel concerns have gas-making apparatus in their plants in case of a breakdown or a diminished supply from the gas-fields. Natural gas is used in no less than 1100 manufacturing establishments in Pennsylvania, and, although the production in 1900 was less than half of what it was in 1888, the State still ranks second in the production of this essential fuel. When it was in general use Pittsburgh was no longer the Smoky City. Now that soft coal is the chief fuel product of the town the city is smoky, but to no greater extent than any of the other large manufacturing cities west of the Alleghenies. Indeed, Chicago is probably more smoky to-day than Pittsburgh.

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COAL, COKE, ELECTRICAL MACHINERY, AND GLASS

It is a common saying that iron and steel have made Pittsburgh. It is true enough, but it may be said also that the deposits of coal, and the unsurpassed coke that may be secured from it in the Pittsburgh district, have made the iron and steel. Except for its adjacent deposits of fuel Pittsburgh would not be a great manufacturing city to-day. The coal mines and the rivers for transportation of coal are nature's great gifts to Pittsburgh. The rest of the business is largely a resultant of these.

The bituminous coal district of Pittsburgh covers an area of no less than 14,000 square miles, a territory 2000 miles larger than the entire coal-field of Great Britain. Nearly 35,000,000 tons of it are produced each year by something like 50,000 miners. It has been estimated by experts that the supply of this district alone will last at the present rate of mining from 700 to 1000 years. The annual coal production of Pennsylvania is more than one-half of that of the United States, and of bituminous coal the Pittsburgh district produced last year more than one-third of that grade mined in the entire country. Coal can be delivered by boat from Pittsburgh at New Orleans for $1 50 a ton—in fact, as cheaply as it can be hauled by rail to the Atlantic coast for shipment. This fact is of tremendous significance to Pittsburgh. It has built up a great mining interest there. Pittsburgh itself probably uses less than one-tenth of the coal it produces, but it supplies a vast territory from the beginning of the Ohio to the Gulf.

There are whole towns given up exclusively to coal-mining. None but miners practically live there. The development of the mining system has been most progressive. A large quantity of machinery is used in the industry. Electric automatic coal-cutting machines are common, big plants are used to force fresh air into the mines constantly, automatic hoisting-machines are common, and great contrivances load the coal in large quantities are in use, a vast difference from the early days when the coal was taken from the pits in the Monongahela Valley hills across the river, and loaded in vessels by handbarrows pushed over gangplanks.

The Pittsburgh coal was first used by Colonel James Burd in 1759. It was first shipped down the river in boats in 1817. Previous to that time, in 1811, the first steamboat was launched at Pittsburgh, having been built there. The first railroad shipment of coal from Pittsburgh occurred in 1851, and between 1817 and that year the shipments were entirely by water. At first the coal was carried by flat-bottomed boats about 75 feet long and 16 feet wide. A pair of these boats were lashed together, and then floated down the river, when the freshets came, by man power, a good deal like the rafts of lumber are floated to market. A crew of twenty-five men was for each pair of boats, and as many as 25,000 bushels of coal were in the two boats.

It was a great sight in those days to watch the coal-boats leave. Men eagerly gave up their ordinary work to make the trip down the river. There was a fascination in this primitive form of travel with the opportunity it afforded to see a little part of the great outside world.

Gradually the towing system came into use, and after a time the boats grew to a size of 170 feet long and 26 feet wide, and now it is common to see one towing steamer deliver no less than 1,000,000 bushels of coal at New Orleans, where in the early days of the trade 50,000 bushels were delivered by a pair of floaters. The government's demand for coal, in its Mississippi operations in the civil war, gave a great impetus to the trade in the early sixties, and this led to the development of the towing system, which revolutionized the coal-carrying trade of the Pittsburgh district.

Then came the development of the locks with their pools, and the freedom of the trade from charges of lockage, and nowadays approximately 200,000,000 bushels of coal are water-borne in the Pittsburgh district a year. If it were not for this water system of carriage of fuel the Pittsburgh industries could not exist. The railroads could not begin to carry the product. One of the coal companies of the place, formed from 120 separate concerns, has a capital of $64,000,000, and has in its fields an estimated supply of 8,000,000,000 tons. It owns 6000 coal-cars, and it employs 30,000 men.

EXTENT OF THE COKE INDUSTRY

Coke is a product of bituminous coal from which the impurities have been burned, leaving a product of nearly pure carbon. It is indispensable in the making of steel. The best coke in the world is made in the Connellsville district, near Pittsburgh. For twenty years the Connellsville region has produced a little more than one-half of the entire coke product of the country. In 1901 the value of the coke made in the district was $25,000,000 in round numbers. More than 12,500,000 tons were produced. What this means to the railroad may be realized from the fact that the daily shipments of coke in the Connellsville region often run as high as 2000 cars, and that 50,000 cars a month is a common record. Nearly 22,000 flaring coke-ovens send out their flames and smoke into the region, making the nights picturesque and the days gloomy in the country roundabout.

The coke industry in this region, according to the 1900 census, increased 113 per cent. in ten years. It employs more than 20,000 wage-earners, and the subsidiary railroad traffic employs thousands more. In 1902 the records of the Car Service Association show that Pittsburgh took 3,794,631 tons of coke, an increase over the previous year of 351,000 tons. The West took 6,966,344 tons of coke, passing through the Pittsburgh district in 1902, an increase over the previous year of 804,000 tons. The increase in the coke product, passing to or through Pittsburgh in 1902 over 1901, was more than 1,155,000 tons. It required 177,000 cars to haul Pittsburgh's share of the product, and for the Western traffic no less than 300,910 cars were used, making a total of 478,221 cars. This was 25,000 cars more than were used the previous year. The number of cars would have been greater had not there been an increase in the size of the cars. The average car, up to 1900, carried eighteen tons of coke. It has since been raised to twenty-five tons a car. It was over the shipments of coke that the celebrated Pittsburgh car famine really began. Grain shipments from the West robbed the industry of its normal supply of cars, and, as a result, the steel industry suffered seriously. The railroads are hurrying orders for new cars, and it is expected that little difficulty will be experienced in that direction hereafter.

ELECTRICAL MACHINERY MAKING

There are two places in the United States where electrical machinery manufacture has centred with enormous plants. One of them is in Pittsburgh. No story of the city of Pittsburgh and its growth would be complete or adequate without the mention of George Westinghouse and his great success, not only in perfecting electrical and other devices, but in carrying on enormous business enterprises. The various Westinghouse companies, concerned in the making of air-brakes, engines of various kinds, electrical devices, and lamps, are capitalized at more than $50,000,000, and employ more than 12,000 persons.

The name Westinghouse is synonymous in the electrical and machine-making world in Pittsburgh with that of Carnegie in the steel industry. He first attracted attention by his air-brake invention and its subsequent development. Then came his manufacture of various kinds of engines on a colossal scale. In the late eighties the use of electrical devices began to supplant to some extent the use of pneumatic power in signal machinery, and Mr. Westinghouse, who had been working for many years in the electrical field, went into that business on a large scale. He bought European patents, and he studied out some of the most difficult problems that have been mastered in the great field of electrical work. The result is an enormous plant in East Pittsburgh, employing more than 7500 persons and occupying fifty acres. A great machine-shop there nearly a quarter of a mile long is being duplicated. It has its own light and power plant. There is no more impressive factory in the country.

The use of the alternate current in electric work is due chiefly to Mr. Westinghouse, who co-operated with Tesla in his experiments and the scores of electrical devices, from massive generators and armatures and motors of all kinds, down to the little things used in electrical work, reveal the magnitude of this great enterprise. There are more than 30,000 Westinghouse railway motors in operation to-day on the trolley-cars of the country. In every department of activity where electricity is used Mr. Westinghouse's products may be seen. He is still under sixty, has time for large real-estate operations, and numbers many foreign decorations among his trophies of mechanical skill.

Over in England there is a Westinghouse company that has a plant which occupies 130 acres of land in Manchester. The British company is capitalized at $7,500,000, and from this works the foreign market is supplied. The plant is practically as large as that at East Pittsburgh.

THE MANUFACTURE OF GLASS

The State of Pennsylvania stands first in the country in the making of glass, and most of this comes from the Pittsburgh region. Nearly forty per cent. of the glass made in the United States comes from this district. The State is first in the manufacture of plate and window glass, tableware and fine blow-ware, second in the making of fruit jars and bottles, and first in the making of lamp chimneys. It was due to the fact that Pennsylvania men "struck oil" in 1848 that the extensive making of lamp chimneys began in Pennsylvania.

The reason why the western part of the State is especially adapted to the making of glass is the fact that in Juniata and Fayette counties a supply of glass-sand is found equal to any in the world. The presence of cheap bituminous coal and of natural gas served to fix the industry in the region where this supply of raw material is most accessible. The making of glass is a simple process, the details of which are known to all. It is still one of the best-paid industries in the country.

It would not be fitting to close an article on Pittsburgh without some reference to Andrew Carnegie's benefactions to the city. Although his home is now in New York, Mr. Carnegie has been and is the most conspicuous of the city's product of citizenship. Not only did he make his vast fortune in the town, but he has endeavored and has succeeded in introducing most of the refining influences that are noteworthy in the place. He gave $820,000 for the great Carnegie Library that stands close to the entrance of Schenley Park, and he gave $450,000 for the various branch libraries of this institution in the smaller towns roundabout where the workmen that he once employed live. He has given, in addition, $5,000,000 for the extension of the Library Building and the upbuilding of the Carnegie Institute, where art and science may be developed in the town. In addition, he has given $2,000,000 for the endowment of the Carnegie Institute. Moreover, he is about to give $2,000,000 for the endowment and equipment of a School of Technology near the Carnegie Library and Institute, a school to be devoted largely to the most improved methods of manual training.

Looking back at what Mr. Carnegie has done for the steel industry and the consequent advancement of the prosperity of Pittsburgh, and then considering what he is doing still in the way of benefactions for the place, one may say truly that he is the foremost of the human products of the city. After he is gone—and may the years be many before that comes—it would seem to be fitting that his statue should be placed at the entrance of Schenley Park. That would be the proper place for it, and one feels that his statue should be the only one to occupy that delightful spot.

Taking it all in all, Pittsburgh is a place for all Americans to be proud of justly.

Edward T. C. Slease & Co.

PITTSBURGH is increasing its reputation for its financial institutions almost as rapidly as it has arrived at its supremacy in the industrial world. Its representative banking and brokerage houses are recognized factors all over the country, and prominent among them is the rising firm of Edward T. C. Slease & Co. This firm was organized three years ago by Edward T. C. Slease and H. B. Guthrie, brother of C. S. Guthrie, president of the American Steel Hoop Company, before it was merged into the great Steel Corporation. Mr. H. B. Guthrie, in August last, retired from the firm and moved to New York city. He purchased a seat in the New York Stock Exchange for $65,000, and soon became a prominent financier in

Edward T. C. Slease

Wall Street. His partner, Mr. Edward T. C. Slease continued his business in Pittsburgh in the Arrott Building, and, although one of the youngest financial institutions of the great steel city, it is now recognized as one of the leaders. The business methods of the present firm are up to date, and at the same time conservative and safe. It has branch offices at Wheeling, West Virginia; Steubenville, Ohio; East Liverpool, Ohio; Youngstown, Ohio; and McKeesport, Pennsylvania.

There is a direct system of private wires, east and west, so that the firm can execute immediate orders with all the leading exchanges, and every department is controlled by a competent manager and financier. Mr. Edward T. C. Slease, the active head of the house, is the son of the well-known Methodist-Episcopal minister, the Rev. William D. Slease, D.D., and the grandson of James Crawford, the famous Ohio banker and capitalist. Mr. Slease is a graduate of the University of Pennsylvania.

He married in 1896 Laura I., daughter of the late Captain Adam Jacobs, of Brownsville, who was one of the pioneer steamboat-builders of the Monongahela Valley. The family resides in a handsome residence on Fifth Avenue. Mr. Slease is devotedly fond of horses. He has some of the finest carriage and saddle horses in Pittsburgh, and he is noted for his handsome equipages. He is foremost in any work for the benefit and improvement of Pittsburgh, and he is a member of many clubs and social organizations, among them being the Duquesne, Monongahela, and Country clubs.

He is looked up to as one of the principal financial factors of the Pittsburgh money-market, and among the leaders of its great future, both commercially and financially.

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The Pittsburgh Coal Company

AMONG the many great industries which have helped to make Pittsburgh one of the greatest industrial centres of the world, a prominent and important organization is the Pittsburgh Coal Company, which was incorporated under the laws of the State of New Jersey in August, 1899, and which was among the pioneers of the great movement for combination and consolidation which has in a few years revolutionized the industrial methods of Pittsburgh, and has made it the most marvellous and progressive city in the world. The company was formed to consolidate the business and acquire the properties of the largest producers and shippers of steam and gas coal in Pittsburgh and its vicinity. The following companies are merged in this gigantic organization, and it includes D. M. Anderson, Frank Armstrong, Alexander Black Coal Company, Blyth Coal Company, Bower Hills Mining Company, Boyd Coal Company, N. H. Boyd, Beadling Brothers, J. W. Blower, J. D. Boyd, J. D. Boyd Coal Company, Bridgeville Coal Company, J. V. H. Cooke & Sons, J. B. Corey, Columbia Gas Coal Company, Chartrin Block Coal Company, Canonsburg Coal Company, J. E. Douglas, W. L. Dixon & Company, Alexander Dempster, Equitable Coal Company, Essen Coal Company, Eureka Coal Company, Row Galley Mine, First Port Monongahela Gas Coal Company, Fidelity Coal Company, Henriette Floersheim, Federal Coal Company, H. Floersheim, Forest Hill Mining Company, S. A. Gibson, D. R. Hanna, Hanna Brothers, Hartley & Marshall, Hurst & Company, Imperial Coal Company, L. S. Johns, Johnston Coal Mining Company, Keeling Coal Company, Laurel Hill Car and Coal Company, Lake Superior Coal Company, A. W. Melton et al, Mingo Gas Coal Company, Midway Block Coal Company, M. McCue & Company, J. A. McCready, Morgan, Moore, & Baine, Morris & Newell, Moon Run Coal Company, Montour Railroad Company, O. McClintock, W. L. McClintock, Estate of Washington McClintock, Miller's Run Mining Company, Nathaniel Holmes, National Coal Company, J. E. Newell, Northwestern Coal Railway Company, Oak Ridge Coal Company, Limited, Osborne Seager & Company, Panhandle Coal Company, Pennsylvania Title and Trust Company, Pittsburgh Consolidated Coal Company, Pittsburgh, Fairport and Northwestern Dock Company, Pittsburgh and Chicago Gas Coal Company, Provident Mining Company, Pittsburgh and Western Coal and Coke Company, E. W. Powers, Pittsburgh Block Coal Company, Port Royal Coal and Coke Company, Port Royal Dock Company, Pittsburgh and Moon Run Railroad Company, Robbins Coal and Coke Company, Robbins Coal Mining Company, F. L. Robbins, Isaac I. Robertson, W. P. Rend, Jacob E. Ridgeway, Redstone Oil, Coal, and Coke Company, Ridgeway-Bishop Coal Company, Hope Mine Coal Company, W. J. Steen, Saw Mill Run Coal Company, Sheppler Gas Coal Company, Shire Oaks Coal Company, J. H. Somers Fuel Company, J. D. Santers, Jesse H. Sanford, Waverly Coal and Coke Company, Warner Coal and Coke Company, J. H. White, Willow Grove Mining Company, H. K. Wick, Wick Haven Supply Company, H. K. Wick, C. B. Wick and Frank Morrison, Youghiogheny and Wick Haven Railroad Company, Webster Gas Coal Company, R. H. Williams, Walsh-Upstill Coal Company, Youghiogheny Mining Company, Youghiogheny and Lehigh Coal Company, Youghiogheny Gas Coal Company, Youghiogheny River Coal Company, and many others, comprising 80,000 acres of coal lands and 7000 acres of surface land in Allegheny, Fayette, Washington, Westmoreland counties, with docks and plants in many counties and States.

It employs 30,000 people, and its output reaches 20,000,000 tons a year. It also owns undeveloped coal lands covering 50,000 acres, and it is generally known as the great "railroad coal combination" of the West. It owns over thirty miles of railroad, with 5000 cars and seventeen locomotives, and its authorized capital is $64,000,000.

It is now establishing a European market, and it is considered one of the most important coal combinations in the world. The chairman and president is Francis L. Robbins, and it includes in its management such well-known men as H. C. Frick, John A. Bell, D. R. Hanna, Henry W. Oliver, and Grant B. Schley. The head offices are at No. 232 Fifth Avenue, Pittsburgh. The Union Trust Company of Pittsburgh is transfer agent, and the Fidelity Title and Trust Company of Pittsburgh is registrar of the stock.

Francis Le Baron Robbins and American Trust Company of Pittsburgh

THE master mind and presiding genius who controls this gigantic organization is the chairman and president of the board of directors, Francis Le Baron Robbins. Mr. Robbins was born at Ripon, Wisconsin, September 3, 1855. He is the son of Thomas Burr and Alice (Brockway) Robbins. The father was one of the largest coal operators in Western Pennsylvania, and the family have been prominent in the business for

Francis Le Baron Robbins

nearly a century. The pioneer American ancestor was Richard Robbins, who came from England in 1639, and settled at Charlestown, Massachusetts, afterwards removing to Cambridge. The Robbinses have been a prominent New England family for nearly three centuries. Francis Le Baron was educated in Allegheny, and from his youth was brought up in his father's business.

He has always taken a personal interest in the welfare of his great army of employees, and he is highly respected and honored by them. Wielding as he does great power by reason of his many interests he has always tried to use that power honestly and justly. He has been elected president of the Pittsburgh Operators' Association, and is considered a firm friend of the miners. He has been a director of the First National Bank of Pittsburgh for many years, and, in addition to his immense coal interests, he is president of the American Trust Company, which is capitalized at $1,000,000. Mr. Robbins has lived at Allegheny all through his busy business life. He resides in a handsome residence, No. 908 Sherman Avenue, Allegheny, and has a large family.

He married in 1882 Miss Helen Gill, who is also a scion of an old Connecticut family. The power of Mr. Robbins's great coal properties and the immense influence that he wields in the life of the people of Pittsburgh and Allegheny make him an important factor in the movements of his fellow-townsmen. He has always used his influence with conservative fairness, and he is looked up to and respected by his business associates and his thousands of employees.

AMERICAN TRUST COMPANY OF PITTSBURGH.

He is intimately connected with the great majority of financial institutions that help to make Pittsburgh the great commercial city that it is to-day, and among them is the *American Trust Company*, which is one of the youngest and at the same time one of the soundest trust companies in that city of great financial institutions. The American Trust Company commenced business in April, 1901. It was incorporated November 1, 1900, and its capital is $1,000,000. The officers are Francis L. Robbins, president; John D. Nicholson, vice-president; F. H. Skelding, second vice-president; John A. Irwin, secretary and treasurer; and A. M. Neeper, solicitor. Although only two years old, the undivided profits already aggregate $103,879. The offices are at No. 333 Fourth Avenue. According to the *Bankers' Magazine* of New York city the trust company of to-day is a confidential agent in manifold capacities.

It is a bank; it receives deposits; it allows interest on them, and it lends money. Its loans, however, being chiefly on quick collaterals and for short periods, are more apt than those of banks to be of an active and liquidatable sort, and are more easy to be realized upon in times of panic or stringency. It is noteworthy that, even under pressure, there have been few, if any, trust company failures, and it may be regarded as still more remarkable that these institutions are so constituted that even if they should fail it would not necessarily in the least impair the trusts committed to their care. An individual trustee is apt to permit trust funds to become so invested as to be more or less dependent upon his own solvency, but a trust company segregates the funds of its respective trusts, and so invests them as to insure their value, irrespective of the company's fortunes.

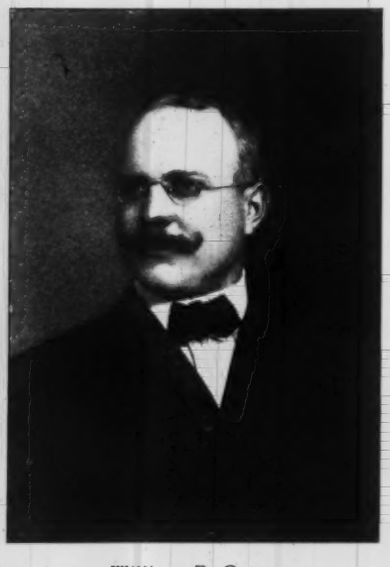
Strict legal provisions also further safeguard all trust investments, and the character of the management of most of such institutions is high, for the people who constitute the bulk of their patrons, being of the most conservative classes in every community, demand this. The trust company, aside from its banking business, acts as executor, guardian, and trustee under wills; as a committee for insane persons, and depository under reorganizations; as register, agent, manager of real estate, trustee for corporate mortgages, and numerous other useful capacities and relations. It accepts deposits and the care of properties under judicial direction.

It cares for the interests of widows and minor children and other dependent persons. It makes investments and collections for its clients, and is, in fact, fitted and equipped to do any financial business that may be committed to it. When funds committed to the care of a trust company have been called for by the owners, the trustees have been able to produce them in every case. This was far from being true when it was the universal practice for individuals to perform the functions of executors, trustees, administrators, guardians, and sureties.

Under such conditions and with such safeguards in the hands of a man with the character and solvency of Francis Le Baron Robbins it can hardly be surprising if an institution like the American Trust Company, young as it is, has a great future before it, and it is certain before many years have passed to be considered one of the richest and most substantial financial institutions of Pittsburgh.

William E. Corey

AMONG the number of young men in the Carnegie Steel Company that have risen from the ranks to positions of great responsibility and trust, in none has the advancement been more striking than in the case of William E. Corey, now the president of that great company. "It has been truly said of him, he is a master of details." Always an indefatigable worker, nothing was too difficult for him to undertake. Thirty-six years of age, he to-day stands at the helm as president of three of the largest



William E. Corey

of the great companies that go to make up the United States Steel Corporation, viz., the Carnegie Steel Company, National Steel Company, and the American Steel Hoop Company. Surely his career is an incentive to the young men of to-day. The son of a retired coal merchant of Braddock, Pennsylvania, he at the age of sixteen obtained a minor position in the laboratory of the Edgar Thomson Steel Works, where his close attention and application to his work attracted to him the attention of his superiors; he was soon transferred to a more responsible position in the order department of the Homestead Steel Works, and in a comparatively short time was made the superintendent of the plate-mills and O. H. departments of this works. It was not long after his appointment to this position that the manufacture of armor plate for the government was begun at Homestead. A strong, capable man being required for the superintendency of this department, Mr. Corey was chosen for the position. How well he filled the requirements of the position is well known. The armor-plate department under his management became world famous, the success in its manufacture being greatly due to the introduction by him of a new and valuable reforging process. Mr. Charles M. Schwab, at that time the general superintendent of the Homestead Steel Works, being called to the presidency of the Carnegie Steel Company, Mr. Corey succeeded him as general superintendent at Homestead, and at the same time was admitted to partnership in the Carnegie Steel Company. To the responsibilities of the management of the Homestead Steel Works, no small task, was soon afterward added the superintendency of the Carrie Furnaces and also the Howard Axle Works, these combined forming the largest group of steel-plants under one head in the world. How well he succeeded is evidenced by the fact that when Mr. Schwab was called to higher responsibilities, Mr. Corey was his logical successor. Truly a wonderful record. Mr. Corey married Miss Laura B. Cooke, of Braddock, Pennsylvania. They have one son, Alan, thirteen years of age.

David M. Clemson

PROMINENT among the protégés of Andrew Carnegie, the men who have been made millionaires by him because of his implicit faith in their industry and loyalty to the United States Steel Corporation, stands David M. Clemson, of Pittsburgh. Mr. Clemson was born near Bellefonte, Centre County, Pennsylvania, in 1855. He had a country-school education until he was nine years old; then he was put to work on a farm, and pursued his studies only in the winter-time. Finally he was apprenticed to a farmer, working night and day for his food and clothes, but no money. After a while he found that he could get a little money besides his board, and he entered the mechanical department of Carnegie's Scotia ore-mines. His industry and perseverance led to his advancement in the ore-mines, until he was given entire charge of the mine machinery. In 1885 the young worker was appointed superintendent of the Scotia mines, and soon after he was transferred to Pittsburg to take charge of the gas and coke interests of Carnegie Brothers & Co., Limited, at the same time retaining general supervision of the ore-mines. Upon the organization of the Carnegie Natural Gas Company Mr. Clemson was elected president, and he was also president of the Pittsburgh Steamship Company, with full control of the fleet of 115 Lake vessels owned by the United

David M. Clemson

States Steel Corporation. These vessels transport the millions of tons of ore from the Lake Superior regions to the different points on Erie, to supply the innumerable furnaces owned and controlled by the Steel Corporation. He now became an important factor in the working of the great corporation, and he was made a member on the boards of the different departments composing the Carnegie Company.

As president of the Carnegie Natural Gas Company, Mr. Clemson has under his personal direction the entire operations of the Carnegie interests in the gas-fields of Pennsylvania and West Virginia. The company has under lease considerably more than 100,000 acres of gas territory in Allegheny, Armstrong, Westmoreland, Washington, and Greene counties in Pennsylvania, and in Tyler, Wetzel, Doddridge, Monongahela, Marion, Ritchie, Marshall, Lewis, and Harrison counties in West Virginia, including 150 gas-producing wells, with 400 miles of main and branch pipe-lines. The company furnishes to the Carnegie plants over sixty million cubic feet of gas per diem, being more than is consumed by the entire city of Pittsburgh. Mr. Clemson is identified with a vast number of business enterprises throughout the country, and he is very generous and charitable.

The Late Capt. J. J. Vandergrift

THE late Captain Jacob J. Vandergrift, of Vandergrift, Pa., has left behind him a record which has helped to make the industrial history of Pittsburgh. Captain Vandergrift was born April 10th, 1827, at Manchester, now part of Allegheny City, Pa. He was the son of William K. and Sophia (Sarver) Vandergrift. His education began at Mrs. Ditmar's School on Third Avenue, Pittsburgh, then at the Second Ward School conducted by J. B. D. Meeds, and at the age of fifteen years he became a cabin-boy on the steamer *Bridgewater*, finally becoming a river-pilot. Captain Vandergrift's first important venture in crude oil was the purchase of 5000 barrels from the Maple Grove Oil Co. He formed one or two successful companies, and in 1865 established a pipe-line between Pithole and "Shafer Farm," a distance of six miles. He started the Star Tank Line, and he founded the firm of Vandergrift & Forman. This was the actual commencement of the great system now known as the "National Transit Co." A year later (in 1871) the firm laid another pipe-line from Fagundas to the Warren and Franklin Railroad, which was first called the "Trunkeyville," and afterwards the "Commonwealth Pipe Line." Then followed in succession the "Sandy Pipe Line"; "Milton Pipe Line"; "Western Pipe Line"; "Franklin Pipe Line"; "Fairview Pipe Line"; "Raymilton Pipe Line"; and "Cleveland Pipe Line." All the competing systems were absorbed and incorporated as the "United Pipe Lines," of which Captain Vandergrift became president.

The Imperial Refinery was established (capacity 2000 barrels per day). This was afterwards merged into the Standard Oil Company, of which Captain Vandergrift became a director. As early as 1875, Captain Vandergrift and his associates, Mr. John Pitcairn, Jr., and Captain C. W. Batchelor, with others, under the name of the Natural

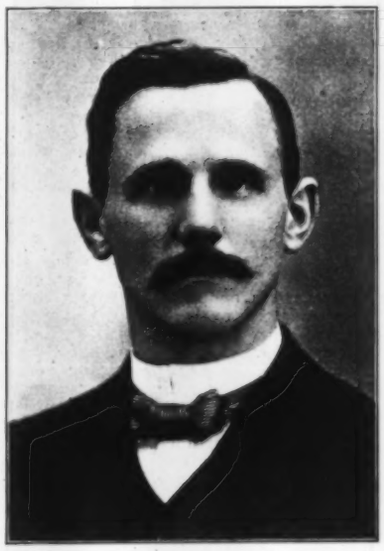
The Late Captain J. J. Vandergrift

Gas Company, Limited, laid the first natural gas line connected with the gas wells near Saxonburg with the great iron mills of Spang, Chalfant, & Co., and Graff, Bennett, & Co. He was president of the Pittsburgh Trust Co., the Butler County National Bank, and the First National Bank of Vandergrift. His other great foundations were the National Tube Company, the Apollo Iron and Steel Company, the American Sheet Steel Company, and the great model town of Vandergrift. The sale of liquor was made impossible. Here more than two thousand men find healthful and profitable employment, and from a few farm hands in 1893 the town has grown to have a population of upwards of 6000.

He entered into his rest "full of days, riches, and honors" on 26th December, 1899.

John H. Jones

PITTSBURGH is the pivotal point of American thrift and enterprise. It is the nation's greatest workshop, and its people are tireless workers. To be an executive head of a large Pittsburgh corporation marks a man as being a leader of men and a master mind in the great world of commerce and finance. Such a one is John H. Jones, the prominent coal operator, and a moving factor in the bituminous coal trade and business world. Mr. Jones was born at Greenock, Allegheny County, Pennsylvania, in the year 1866. He is president of the Pittsburgh and Buffalo Company, the Manufacturers' and Consumers' Coal Company; treasurer of the Johnetta Coal Company, and one of the largest individual owners of coal land in the United States, representing a united interest of at least $5,000,000. Mr. Jones is a thoroughly trained man in the coal business. He was educated to it, and, entering the mines when a mere boy, he has worked his way up through every grade until he is now one of the most experienced operators in the coal regions. He is connected in business with his father, James Jones, his brothers, Thomas P. Jones, William I. Jones, David G. Jones, and Harry P. Jones, the family together forming one of the strongest interests in the coal industry of the country at the present time. They own six of the largest coal-mines in the country,—the Hazel Mine at Canonsburg, Pennsylvania; the Johnetta Mines Nos. 1 and 2 at Johnetta, Pennsylvania; the Bertha Mines at Bruce, Pennsylvania; the Blanche Mines at Anderson, Pennsylvania; the Rachel Mines at Wilson, Pennsylvania; and others,—covering



John H. Jones

an acreage of 25,000 acres, including the finest gas, steam, and cooking coals in the State. The Pittsburgh and Buffalo Company also manufacture sewer pipe, hollow block, paving and building brick, and mine cars. The corporation owns thousands of the most modern steel and wooden cars in America, and is adding to them every day. The sewer-pipe and brick works are considered as the most complete plants in the mining regions, and they have made the town of Johnetta, thirty-three miles north of Pittsburgh, famous as an industrial centre and a model working-man's town. Besides his numerous interests, Mr. Jones is a director of the Federal National Bank of Pittsburgh, which is one of the strongest financial institutions in the State. He is also a member of the chambers of commerce of Pittsburgh and Cincinnati, and of the Duquesne and Union clubs of Pittsburgh. As an instance of the development of the coal lands under the energy and genius of Mr. Jones, it may be stated that in two years the capacity has reached 11,500 tons a day.

Henry Bruce Beatty

AMONG the Pittsburgh men of success and prominence is Henry Bruce Beatty, president of the Manufacturers' Light and Heat Company. He was born in Mercer County, Pennsylvania, and is the second son of Ebenezer S. Beatty, a pioneer in the oil business, in Oil City. The Beattys are descended from an old Scotch family who fled from Ireland during the persecution of the Scotch Covenanters, and came to America, when Ebenezer, the great-grandfather of Henry Bruce, was a mere child. He fought in the Colonial forces in the Revolutionary war, and his ancestors have fought for the

Henry Bruce Beatty

Union in every war since 1776. Mr. Beatty was educated in Oil City, and he started his business career in the oil-producing business and in his father's store at Oil Creek.

Afterwards he was with Strong & Gibson in the coal business. In 1879 he attempted to pipe a burning well in Slippery Rock Township, Butler County, to Newcastle, but the young man's ideas were in advance of the times, and he was unable to interest his fellow-townsmen in the scheme, and it was thought to be visionary. In 1881 he removed to the Bradford oil-field, becoming a recognized leader in the oil and gas interests, and an expert authority on all subjects concerning gas. During 1884 and 1885 he was an active member of the Bradford Oil Exchange. In 1887 he returned to Oil City, and in connection with O. H. Strong he formed the Oakdale Farm and Garden Company, starting out as a rose-grower, and he soon founded the largest exclusive rose-growing establishment in the United States.

He made such rapid progress that he became foremost among the florists of America, and was one of the founders of the American Florist Society, and an influential member of the American Florist and American Rose societies. He also continued to advance his oil interests, and in 1889 he owned valuable properties in McKean, Warren, and Venango counties, was a member of the Manufacturers' Natural Gas Company of Pittsburgh, and, in 1894, a member of the board of directors. In 1896 he was elected president of the company, and has since succeeded, by purchase, merger, and consolidation, in acquiring nine important gas companies, which are now incorporated as the Manufacturers' Light and Heat Company, with a capital of $6,500,000. Mr. Beatty now resides in Pittsburgh. He has one of the handsomest houses at the East End, his summer residence being Oakwood, Oil City, Pennsylvania. He is a student of literature, music, and art, and possesses a valuable library of rare books. He is a member of the Duquesne, Union, and Monongahela clubs of Pittsburgh, the Ivy Club, Oil City Boat Club, the American Florist Society, the American Rose Society, and is a prominent and enthusiastic Mason.

Murry Adolph Verner

PITTSBURGH has been well named the city of brains and brawn, and a typical representative of this progressive class of Americans is Murry Adolph Verner, president of the Pennsylvania and Mahoning Valley Railway Company, who has built more railroads than any other man in Pennsylvania.

Mr. Verner was born in Pittsburgh in 1853. He is the son of James Verner, who built the first street railroad west of the Alleghenies. He was educated at the public schools of Pittsburgh, and nearly all his life he has devoted himself to transportation and the building of railroads in many States. He built the Citizens' Traction Company's cable road; built and was president of the Pittsburgh and Birmingham Traction Company, and electric roads in Buffalo, Rochester, New York, Indianapolis, and Norfolk, Virginia. Mr. Verner devoted himself to politics early in life. He interested himself with T. S. Bigelow in the Citizens party movement of Pittsburgh, and in 1903 he succeeded in electing the recorder. He has always been especially active in any work that would be of advantage or benefit to the city of Pittsburgh, and he has always been an ardent Republican. The Pennsylvania and Mahoning Valley Railway Company, of

Murry Adolph Verner

which Mr. Verner is president, was incorporated May, 1902, under the laws of Pennsylvania. It extends up and down the Mahoning and Shenango valleys, a distance of nearly forty miles, and covers a population of 150,000. The capital stock is $5,000,000, and the general offices are at Youngstown, Ohio.

Mr. Verner has always been very liberal in his donations to the good works and charities of his native city, but his gifts have always been kept from the public. He married Miss Barbara Bailey, a native of Pittsburgh, and he has a family of three children—Alice, Catharine, and James Park. He belongs to many clubs and social organizations, among them being the Duquesne, Union, Monongahela, Country clubs of Pittsburgh, and the Union Club of Cleveland. Whenever a movement for the betterment of Pittsburgh has been started Mr. Verner is always found in the front ranks, and is ever ready and willing to spend his time and wealth for the benefit of his native city.

The National Tube Company

AMONG the many important corporations which have been merged into the consolidation of the great United States Steel Corporation, the National Tube Company stands very prominent. The United States Tube Company was incorporated in 1899 under the laws of the State of New Jersey, and it acquired the following corporations: The Allison Manufacturing Company's tube-mills, American Tube and Iron Company, Chester Pipe and Tube Company, Cohoes Tube Works, Delaware Iron Company, Morris Tasker & Co., National Galvanizing Works, Ohio Tube Company, Oil City Tube Company, Oil Well Supply Company's Continental Tube Works, Elba Iron Works, Pennsylvania Tube Works, Riverside Iron Works, and the Syracuse Tube Company. The capitalization of the company in 1900 was placed at $80,000,000, and it was so estimated in 1901 when it became one of the constituent companies of the United States Steel Corporation. The nature of the goods manufactured by the company is tubular products of every kind and description, including butt and lap-weld merchant pipe, black and galvanized, boiler tubes, oil-well tubing, casing, and line pipe, etc. The various plants are situated at McKeesport, Pittsburgh, Middletown, Chester, Philadelphia, Elwood City, and Oil City, Pennsylvania; Cohoes and Syracuse, New York; Wheeling, West Virginia; Youngstown and Warren, Ohio; and Newcastle, Delaware. The annual capacity of the plants is, by coke-plant product, 200,000 tons; blast-furnaces, 600,000 tons; steel-works, 450,000 tons; rolling-mills, 600,000 tons; and pipe and tube mills, 900,000 tons; — aggregating the immense output every year of 2,750,000 tons. The number of hands employed is 17,000, and the company reaches all the markets of the world. The incorporators of the company were William G. Chapman, Jr., Albert S. Ridley, and Francis B. Pollak, and the first board of directors and officers were E. C. Converse, president; Joshua Rhodes, chairman; F. J. Hearne, first vice-president; Horace Crosby, second vice-president; Francis L. Potts, third vice-president; A. S. Matheson, general manager; Arthur F. Luke, treasurer; William H. Latshaw, first assistant treasurer; and E. H. Osborne, secretary. The board of directors: Joshua Rhodes, J. J. Vandergrift, Charles H. Coster, F. J. Hearne, Francis L. Potts, Daniel O'Day, A. S. Matheson, O. C. Barber, J. N. Vance, E. C. Converse, William S. Eaton, William B. Rhodes, F. R. Tobey, John Eaton, Jonathan Rowland, Horace Crosby, John Don, William Nelson Cromwell, Arthur F. Luke, and Henry Aird. The present officers of the National Tube Company are William B. Schiller, president; Edward Worcester, first vice-president and general manager of sales; John D. Cuthbertson, second vice-president, treasurer and secretary; Taylor Allderdice, assistant to president; and B. C. Morse, assistant treasurer and secretary.

The company has also acquired many valuable patents, and owns factories, coke-plants, mills, and coal properties covering 1933 acres. It manufactures ninety per cent. of the capacity of the United States, and its capacity is four times the total annual output of the entire British mills.

The growth of the National Tube Company has been phenomenal in its rapidity. Its career has only covered about twenty years in Boston and Pittsburgh, and yet it is to-day capitalized at nearly $100,000,000, and is the most important corporation which forms an integral part of the great Steel Corporation, and it is that company's richest and most valuable asset. It is the greatest wrought-iron pipe-works in the whole world, and it manufactures every variety of wrought-iron pipe for steam, gas, or water, for boiler tubes, and pipes used for artesian, salt, oil, or gas wells. It is stated that the greater proportion of all the wrought-iron pipe made in this country is the product of this giant corporation. This colossal concern was first started in Boston, but it now has branches in New York, Philadelphia, Pittsburgh, St. Louis, and Chicago. The company was one of the first to use natural gas for fuel in the manufacture of iron.

The late William A. Herron

The late William A. Herron

WILLIAM A. HERRON was born in Pittsburgh, August 7, 1821. His grandfather, Major James Herron, was prominent in the Revolutionary war, and his maternal grandfather, Colonel James Anderson, was a personal friend of George Washington. He was a brass-founder, manufactured glass, and owned large tracts of coal land. The firm of Herron, Blackburn, & Co. became very prominent in Pittsburgh, and in 1860 W. A. Herron founded the German Bank. He also organized the Iron City Trust Company, which afterwards became the Second National Bank. He was the first president of the People's Savings Bank, a large real-estate holder, and head of the firm of William A. Herron & Sons.

Homer J. Lindsay

Homer J. Lindsay

THE Carnegie Steel Company and its allied interests have turned out many men who have made a name for themselves in the industrial world. In this great corporation, where only merit and ability are recognized for promotion, the man who would get to the top must necessarily be ever alert to opportunities offered and take advantage of them.

Homer J. Lindsay, the subject of this sketch, was born in Pittsburgh, December 7, 1860. He is a son of Margaret A. and Samuel D. Lindsay, who was for many years a prominent glass manufacturer and retired from business.

Mr. Lindsay was educated in the public schools of Pittsburgh, and upon graduating his first occupation was as a clerk in the store of Joseph Horne & Co. In 1883, an opportunity presented itself for Mr. Lindsay to enter the employ of the Carnegie Steel Company as an operator. At that time there were nine operators employed. He was later on made special agent for the company, and was further advanced to the important position of assistant to the president under Charles M. Schwab, holding the same position under William E. Corey, the president of the Carnegie Steel Company now.

Mr. Lindsay is a member of the Duquesne Club, the Art Society, the Americus Club of Pittsburgh, the Transportation Club and "The Strollers," of New York. He was married to Miss Emma Knoderer, of Pittsburgh, June 25, 1890.

The American Steel & Wire Company

WIRE of every description is manufactured by the American Steel and Wire Company. This includes wire rope and electrical wires of all kinds, such as bare and insulated wires, trolley wires, telegraph wires, rail bonds for insulating tracks of electrical railways. Barbed wire and all the different varieties of plain steel wires constitute the great bulk of the tonnage of a wire-mill. It is in the finer wires that wonderful skill in wire-drawing is manifested. Some of the company's products are drawn down as fine as hair, and yet maintain considerable tensile strength. A prize over the products of the whole world was awarded the company at the Paris Exposition for piano wires. This is one of the most carefully prepared of all the wires made. Piano wire must be perfectly round and consist of such proportions of metal as to be acoustically perfect. The other fine-wire products are the elaborately finished wires for optical goods, the ribbed wires for umbrellas, elastic flat wires for corset steels, and all the intricate drawn shapes used in sewing-machines, automobiles, and other fine machinery.

Springs of every kind are manufactured, ranging from the fine hair-springs of a watch to the heavy springs for passenger and freight-cars and carriages and upholstery of all kinds. Woven-wire fencing is a great part of the industry, a product that is revolutionizing the system of division of fields, and which, because of the enormous tonnage manufactured, and improved processes of machinery, is rapidly superseding all other forms of staple fencing.

In addition to the wire manufacture the company's great horseshoe plant in Pittsburgh — the famous Shoenberger works — is one of the latest types of the horseshoe industry. This mill turns out the famous "Juniata" horseshoe.

Wire-making differs from most other branches of the steel industry in that it is a process whereby the steel is manipulated cold. The last rolling of the steel in a hot state is done when the billet is made into a "rod." This brings the steel down to a size a little larger than a lead-pencil. From then on the steel is drawn cold through holes in steel dies until the desired sizes are obtained. For finer sizes and wires requiring the most careful work the holes are through rough diamonds.

Wire is not always round. It is in all kinds of shapes, hexagon, oval, odd shapes of all kinds, flat, square, and star-shaped, and any variety to conform to commercial uses.

In addition to the plants located in Pittsburgh and vicinity, the American Steel and Wire Company has plants at Cleveland and Salem, Ohio; Allentown, Pennsylvania; Worcester, Massachusetts; Anderson, Indiana; Joliet, De Kalb, and Waukegan, Illinois; and San Francisco, California.

The Jones & Laughlin Steel Company

THE largest and one of the most important metal interests in Pittsburgh and the surrounding district is the great firm now known as Jones & Laughlin Steel Company. It is a limited partnership association formed under the laws of Pennsylvania for the manufacture of iron and steel products. It owns and operates the American Iron and Steel Works, the Eliza Furnaces, the Soho Furnaces and Plate Mills. The capital is $20,000,000, and it will soon be increased to $50,000,000. The main office is in Pittsburgh, and the principal officers are B. F. Jones, Jr., president; Willis L. King, vice-president; Irwin B. Laughlin, treasurer; W. C. Moreland, secretary; and William Larimer Jones, general manager. It is justly claimed that this gigantic united plant is among the largest, best equipped, and most modern of any in the world. The two blast-furnace plants of the company have an annual capacity of 890,000 gross tons. The capacity of all the mines when completed will be 1,200,000 tons. The company also owns 6000 acres of coking coal land in Washington County; limestone deposits at Hollidaysburg, and its own terminal railway and hot-metal bridge across the Monongahela River. The rolling-mills and steel-works on the South Side and the Soho plants are equipped with every modern improvement known to the metal world. The South Side works contain three ten-ton Bessemer converters with an annual output of 750,000 tons, one twenty-five-ton acid-furnace, and six forty-ton basic furnaces, the capacity being 150,000 tons of ingots a year. There are also a 100,000-ton Talbot furnace, twenty-six heating furnaces, twenty-one trains of rolls, and three steam-hammers, and three blooming-mills, with a daily capacity of 2500 tons. The Soho department comprises four twenty-five-ton acid open-hearth furnaces, three trains of rolls, one single and two double heating furnaces, and ten Siemens regenerating pit furnaces; the total annual capacity of the plants being 900,000 tons billets and blooms, and 800,000 tons of finished rolled material. There are also a spike, rivet, and bolt factory with an annual capacity of 8000 tons, and structural-fitting shops producing 24,000 tons a year, and a chain-factory with an annual capacity of 10,000 tons. The cold-rolling and shafting plant is the largest in the country, with an output of 60,000 tons a year, and forge shops producing 3000 tons. The company owns and leases an immense number of iron-ore properties in the Lake Superior region, and it is now under consideration to build an independent railroad to Lake Erie, to facilitate the handling of the immense traffic. Its present iron-ore tonnage is estimated at 1,500,000 a year, and that will be increased to 2,000,000 tons within the year.

The general direction of this great company is in the hands of Mr. B. F. Jones, Jr., the son of the founder. He entered the sales department of the works in a minor capacity, after graduating from Princeton in 1891, and he became the treasurer of the firm in 1899, chairman in 1901, and president of the newly incorporated company in August, 1902. His father, the founder, still advises his son, although he is nearly eighty years old. He has witnessed the growth of the immense business for half a century, and has seen it rise from a capacity of forty tons a day to one of the greatest industries in the iron country, with a daily output of 3000 tons and an army of 10,000 men in its employ. He has also witnessed the rise of Pittsburgh to be the greatest manufacturing city in the world, and it is to his grasp of business and wonderful industry that this marvellous result is, in a great measure, due. The personnel of this great industrial enterprise is composed of men in the prime of life, who have been trained for the work under the supervision of Mr. Jones, Sr., and who have accustomed themselves to be familiar with every department of a great iron business. The great advance and success of the company proves that they are the right men.

Francis J. Torrance

A WELL-KNOWN Allegheny manufacturer and railroad man is Francis J. Torrance, who was born in Allegheny City, June 27, 1859. In 1875 he became a clerk in the Standard Manufacturing Company, of which his father was president, and finally became treasurer and general manager. In 1901 he was chairman of the executive committee, and when the corporation was merged into the Standard Sanitary Manufacturing Company he was made vice-president. The company manufactures plumbers' enamelled ironware, baths and bath-room appliances, brasswork, and sanitary plumbing supplies. It is the largest establishment of its kind in the world, with branch offices at Pittsburgh, New York city, Louisville, Philadelphia, Chicago, New Orleans, St. Louis, Montreal, Honolulu, Mexico City, London, Paris, Hamburg, St. Petersburg, Cape Town, Sydney, Buenos Ayres, and Havana. He represented his Congressional district at the nomination of Benjamin Harrison, and he was delegate-at-large to the convention at St. Louis which nominated McKinley. He has been select-councilman for nine years, and president of that body for seven years. As a commissioner on lunacy he controls the Pennsylvania criminal and charitable institutions, and he is a delegate-at-large for prisons and charities. He is president of the Washington (Pennsylvania) Electric Street Railway Company; of the Indiana Railway Company; of the Standard Ice Company of Pittsburgh; of the Monongahela and Ohio River Transportation Company; of the Western Pennsylvania Exposition Society, the Pittsburgh Natatorium Company, and the Iron City Brick and Stone Company. He is also director of the Mechanics' National Bank, Pittsburgh; the Third National Bank, Allegheny; the National Union Fire Insurance Company, Pittsburgh, and the Sewickley Valley Trust Company. Chairman of the National Committee of Confederated Supply Associations, has been for two terms president of the Americus Republican Club, and chairman of the Republican city committee of Allegheny.

Joshua W. Rhodes & Co.

AMONG the more important firms of iron manufacturers and producers in the iron district a prominent one is that of Joshua W. Rhodes & Company. The corporation is the outgrowth of Vandervoort & Rhodes, which was organized early in 1895; the present organization was incorporated in 1899, and the present partners are Joshua W. Rhodes, Robert W. Flenniken, and Edwin N. Ohl. The original partner with Mr. Rhodes was Ledlie W. Young, but he died October, 1901. It is a general iron and steel business in the way of buying and selling iron and steel products, and a large sales-agency business. The company owns the Cherry Valley Iron Company, with ore furnaces at Leetonia, Ohio, and a large furnace at Middlesex, Pennsylvania. It is also sales agent and owner of the Penn Coke Company, with ovens and mines in the Connellsville district. They lease from the McCutcheons the Keystone Mills, at Pittsburgh, employing over 800 men and producing 75,000 tons of finished material annually. The capacity of the two furnaces at Leetonia and Middlesex is about 375 tons per day, and 250 men are employed. The firm also owns and operates about 1800 acres of coal land, mining from 500 to 600 tons of coal per day. In fact, it is one of the most important working operations to the east of the Mississippi River. Contracts have been made recently at Leetonia and Middlesex to practically double the capacity.

Joshua W. Rhodes, the president, was born in 1872, and began his career in the Apollo Iron and Steel Company. He has been with the present company since 1897. He has also been connected with the Dollar Savings Bank, of which his father is treasurer. Mr. E. N. Ohl became associated with the firm shortly after the death of Mr. Young. He was previously with the Republic Iron and Steel Company, of which he is still a director.

The A. Garrison Foundry Company

AMONG the more important manufactories of western Pennsylvania is the large iron-foundry known as the A. Garrison Foundry Company of Pittsburgh. This important industry was established in 1803 for the manufacture of kettles, irons, stoves, rakes, etc. It has grown hand in hand with the city of Pittsburgh, and is to-day manufacturing the heaviest description of rolling-mill machinery, and turning out the largest chill and sand rolls in the country. Abram Garrison, Esq., one of the earliest members of this firm, belonged to the well-known Garrison family of New York, the most prominent being the late Commodore Garrison, who was known East and West during the middle part of the last century. Mr. Garrison had as his partner Henry Bollman, and the business developed largely during the early sixties. John H. Ricketson succeeded Mr. Garrison in the management of the business, and when, in 1887, the business was incorporated, Mr. Ricketson was its first president, and retained that position until he died in 1900. The works and buildings of the company cover five acres on the South Side of Pittsburgh. This is, in brief, the history of a business organization which has shared with the community, country, and government periods of prosperity and depression during over one hundred years, and through a quartet of wars. The company has at present a contract to build the largest plate-mill in the United States, and the management and stockholders in making their extensions feel that the century just entered upon, in spite of the enormous progress made by the United States in recent years, will see a development far beyond even that which the past century teaches Americans to hope for. The present management of the company has increased its capital stock, and the location of the plant gives it exceptional shipping facilities and the best labor-market in the country to draw from.

The Hostetter Company

THE immense business conducted under the above corporate name was established in 1853 by Dr. Jacob Hostetter, his son David, and George W. Smith. Hostetter's Stomach Bitters owes its origin to a recipe compounded by the senior member of the firm, who had tested its virtues in an extensive medical practice. It immediately gained popularity, and for fifty years it has maintained its high renown. As the old partners, one by one, departed this life, the interest was merged into The Hostetter Company, in 1889, which has since achieved even greater success.

Dr. David Hostetter, for many years its controlling spirit, was identified with many of the public enterprises of Pittsburgh, and aided materially in developing this line of industry.

Retaining so long a place in public confidence surely vindicates the claims of Hostetter's as a standard Stomach Bitters remedy, and also attests the business sagacity of those who shape its destiny.

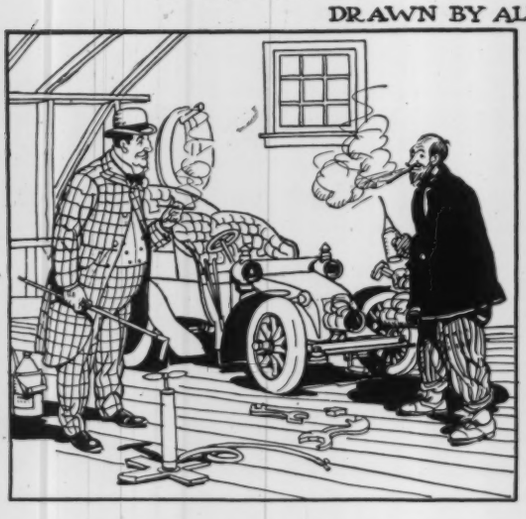
Phillips Mine & Mill Supply Co.

THIS is one of the pioneer mining-equipment companies of Pittsburgh, and was established in 1863. It owns and controls a large number of patents on devices for dumping, screening, and handling coal, and on cars, car-wheels, etc. One of the most valuable inventions is the "Phillips patent automatic cross-over car dump," which has superseded all others by its merits. The facilities of this company have heretofore been inadequate to carry out its business, but it has now completed extensive additions, and its capacity has been doubled, making the output over one hundred cars, car-wheels, and mining machinery per day. It is now the largest concern of its kind in the United States, and covers trade in America, Canada, and Mexico.

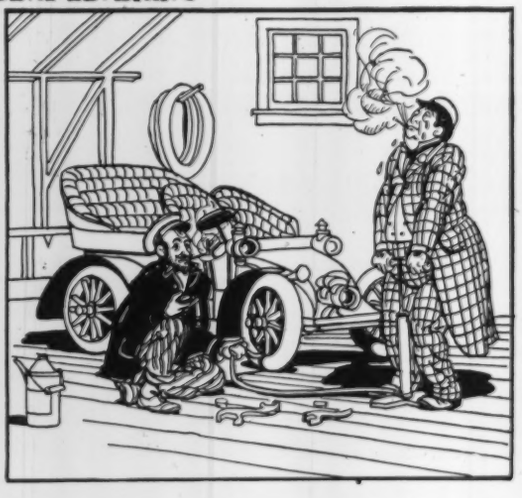
The AUTO RIDE

A HORSE-LESS DELUSION UNHORSED

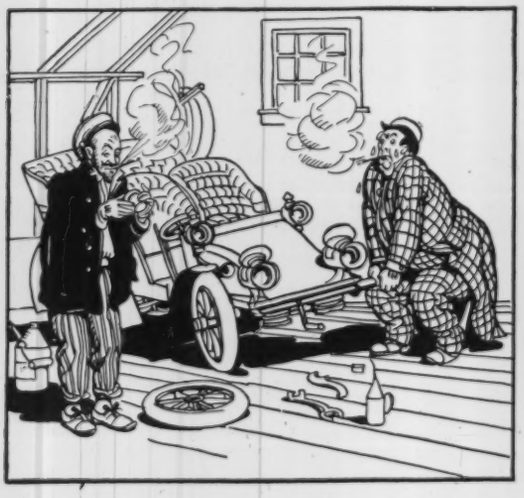
DRAWN BY ALBERT LEVERING



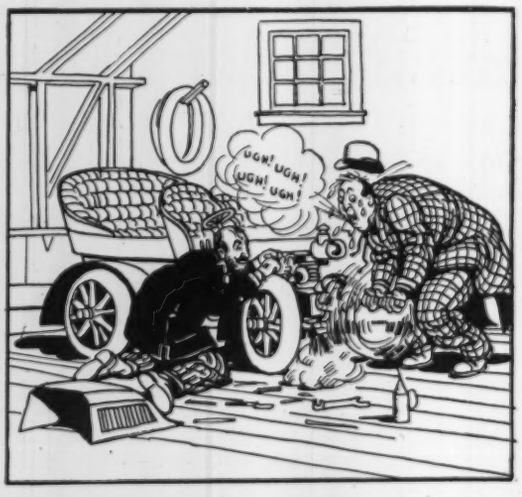
The Invited. "*I presume it were jolly for me to tender my humble services?*"
The Enthusiast. "*Not at all; however, a tap here and there, and we're off.*"



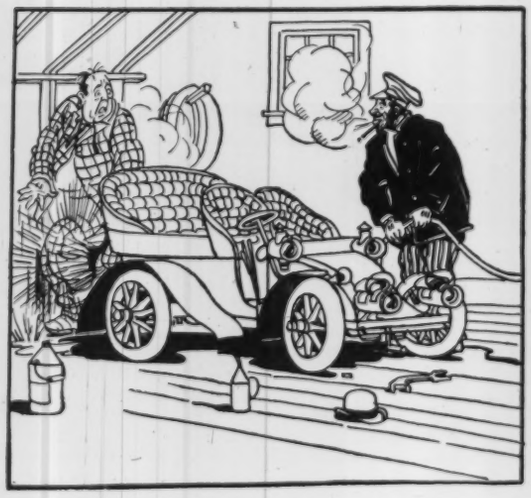
The Enthusiast. "*Surprising how quick the tires fill using a big pump like that, eh?*"



The Enthusiast. "*Just hold that a second, until I see what ails this hub.*"



The Enthusiast. "*Turn a little faster, old man, or you'll never get her started.*"



The Enthusiast. "*I say, just let me know when the water spurts back there, will you?*"

The Enthusiast. "*Great, ain't it?*"
The Victim. "*M-m-mmm-m.*"

A Naval Engagement Indoors

At a review held recently at the Thirteenth Regiment Armory in Brooklyn, the Second Battalion of the New York State naval militia took part in some curious and interesting manœuvres. The interior of the exhibition hall was arranged to represent a harbor commanded by defensive works on shore, and a mimic attack was made by the naval forces on the improvised fort. The attacking party operated in a boat which was a perfect model of the ten-oared cutter used in the United States navy, so constructed as to rest on the floor at the water-line. The boat was mounted on three wheels, two forward and one aft, so placed as not to be visible from the outside. Oars of the usual kind were used, the boat being propelled by means of a mechanism connecting the oar-handles with the axles of the wheels; a one-pounder Hotchkiss rapid-fire gun mounted in the bow of the boat fired blank charges during the attack. A structure representing the bow of a war-ship and occupying a corner of the room commanding the fort, took an active part in the engagement.

ADVICE TO MOTHERS.—MRS. WINSLOW'S SOOTHING SYRUP should always be used for children teething. It soothes the child, softens the gums, allays all pain, cures wind colic, and is the best remedy for diarrhœa.—[*Adv.*]

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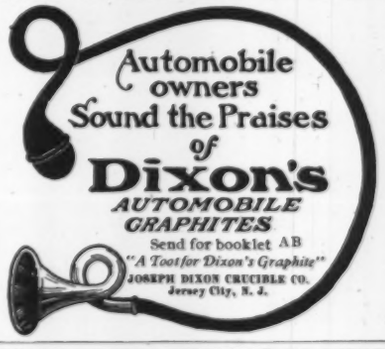
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"Neither religious problems, nor politics, nor social contests occupy Julie Le Breton's mind. She is wrapped in an o'ermastering passion of love."

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Edison's Latest Invention

SOME years ago Mr. Edison invented a process for extracting finely divided iron ore from the rocks of New Jersey. There are vast quantities of this iron ore in the rocks of the Atlantic seaboard, but it is so finely divided that it cannot be mined in the ordinary way. Edison's plan was to crush the ore-laden rocks and drop the resulting sand past the faces of powerful electromagnets. The iron was thereby separated or deflected from the sand, after which it was made up into briquettes and shipped to the smelters. Mechanically, the process was successful, but it did not prove commercially profitable; it was found impossible to compete with the mines of the Great Lake district, where the ore is so pure and soft that it can be dug out of the ground with steam-shovels. Edison, undeterred by this drawback, laid aside his ore scheme for the time being and developed his crushing plant, with a view to producing especially fine cement sand. This developed into a fairly profitable business, but nothing like what was anticipated for the ore plant. So again the inventor began to readapt his machinery, this time to the extraction of gold. He now has a process somewhat resembling his first scheme, except that the crushed gold ore is dropped, not past magnet-faces, but through an ingenious blower which wafts the comparatively light sand to one side, and allows the heavier precious metal to fall straight down into a bin of its own.

A Valuable Life

IT is said that, with the exception of King Edward VII., Mr. L. Rodman Wanamaker, the son of the great merchant, is the most heavily insured person alive. The sum of his Majesty's policy is not stated, but Mr. Wanamaker's is reported to be $2,000,000, which involves a tidy premium of $30,000 a year. There are not many, we imagine, in Mr. Wanamaker's class; his father, John Wanamaker, values his life at $1,500,000, and Mr. John M. Mack is insured for $1,250,000. It would be interesting to know how much, if anything, the deaths of the various ladies and gentlemen of the Rockefeller, Astor, and Vanderbilt contingents would cost the insurance companies.

The Secret of Phosphorescence

SCIENTISTS in America are turning their attention towards the practical possibilities of phosphorescence. The researches of Professor McKissick of the Auburn (Alabama) Polytechnic Institute, Professor Hallock of Columbia, and others, prove that darkness is, after all, only a relative term; that most, if not all, common substances store up sunlight during the day and emit it in the form of more or less powerful rays during the night. Professor McKissick has been able to discern the emission of rays from over a dozen well-known chemicals which had previously been exposed to sunlight, and from such common substances as chalk, glucose, and sugar; sugar of the common brown variety was found to yield the most light. Not only was Professor McKissick able to take photographs by means of this light, but its quality was so similar to that of the X-ray that it affected a sensitive plate through an intervening thickness of two and a half inches of wood. Professor Hallock is of the opinion that some practical use might be made of the properties of phosphorescence, and points to the way in which nature lights the ocean depths, and to the light of the firefly, as examples of what can be done. He thinks that much practical utility might be gained from the universal use of luminous paints which could be spread in dark hallways and on the walls and ceilings of office buildings to help out the twilight. In fact, it would seem that we are near to the secret of phosphorescence. When such common substances as sugar, glucose, and chalk are found to absorb sunlight all day and to give it off in rays during the night, the discovery of some means for rendering those rays visible does not seem like a very far cry into the future.

A Novel Kind of Buoy

A GERMAN inventor has contrived an electric buoy which is lighted by a current generated by the action of the waves. Wires connecting with a power-house on shore are dispensed with, and the motion of the waves is utilized to operate a small dynamo which feeds the current into a storage battery; by

The Electric Buoy in Operation

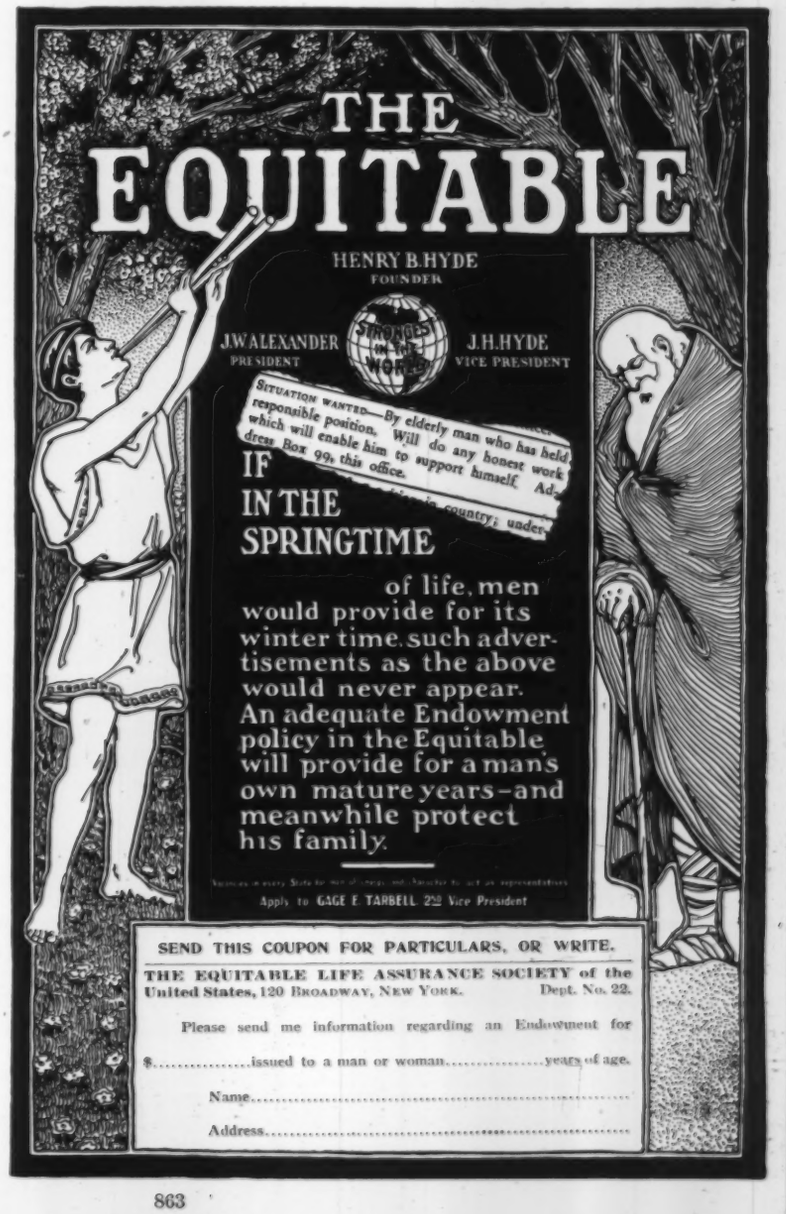
this means the supply for the lamp is kept uniform. Bells are also rung by the movement of the buoy, in order that ships may be warned, even in fog, of the nearness of the coast. Experiments to test the practical working of the invention are said to be in progress in German harbors.

A Successful Woman Composer

THE recent production at the Metropolitan Opera House, New York, of Miss Ethel M. Smyth's music-drama, "Der Wald," has awakened interest in the very few other women who have had operas publicly produced. The only woman who has succeeded to any notable degree in the field of operatic composition, Ingeborg von Bronsart, recently celebrated in Germany her fiftieth artistic jubilee. A pupil of Adolf Henselt, she studied later with Franz Liszt, at Weimar, where she met and married the pianist-composer Hans von Bronsart. Unlike Miss Smyth, she has succeeded in winning both popular success and critical commendation for her work. Her opera, "Jery and Bätely," has been produced in fourteen theatres, and her "Hiarne" in five. Frau von Bronsart's most recent work is an opera in one act, entitled "Die Sühne." Besides her stage-works, she has written a quantity of piano pieces, songs, and chamber music.

Artificial Food

FIVE years ago Sir William Crookes made the startling announcement that the world's wheat supply would fail to keep pace with the needs of civilization after the lapse of thirty-three years. He suggested, as a remedy, the extraction of nitrogen from the air for the purpose of fertilizing the worn-out soil; but we are much nearer the mark now than in 1898, and little progress has been made towards a practical mode of nitrogen manufacture. Other scientists have attacked the problem from a different standpoint; that is, the making of artificial foods. Some of these foods are already on the market, and we are assured that the day is not far distant when we shall be able to live upon the products of the test tube. In the case of those artificial foods which are now commonly sold, however, the substance is an extract of foods already used and not a true substitute. Actual substitutes for the natural foods of the day have been made, chiefly from coal-tar. A German chemist named Fischer has accomplished wonderful results in the production of sugars from waste sources. Professor Lilienfeld of Vienna is reported to have made artificial albumen,—a discovery which, if authentic, is of im-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mense importance to mankind. It may be found, however, that the cost of production will prohibit the sale of this artificial product. The whole problem of artificial food production, in fact, hinges on this question of price; any number of good substitutes for natural food have been made, but in each case the cost of manufacture has been prohibitive.

Why We Shake Hands

THE Prussian officer who held it his duty to kill a mere soldier who offered to shake hands with him had, from the official Prussian point of view, a complete case. Handshaking implies a certain degree of equality, and it is not possible for a Prussian officer to imagine any equal except another Prussian officer. Clearly, any act suggesting such a thing could not be expiated by any punishment short of the immediate death of the offender.

The custom of handshaking dates back to prehistoric times, a relic of those savage days when strangers could not meet without suspicion of murderous purpose. Then all men went abroad with weapons and shields, and, when they met, would stand in pleasant converse, each with his shield upon his left arm and with right hands clasped so that there would be no chance for a sudden swing of the knife or bludgeon. The right hand was invariably used for the weapon, with the result that we are a right-handed race. The reason for this lay undoubtedly in the fact that the left arm was always employed in the important work of shielding the heart. Among the common people of the Aryan race, the old pledge of amity in yielding the right hand to be grasped and held has since remained the chief token of open friendship. In the Iliad the returning chiefs were "greeted with extended hands." Even at that remote day the early significance of the handclasp had been lost in the nobler meaning of civilized life. But it remains a salutation in which a greater or less degree of equality is claimed or conceded. It is, therefore, possible for a humble person to shake hands with the President of the United States, but not with an officer of the Prussian army.

The Reliance and Shamrock III.

THE *Reliance*, so far as the trials have gone, fulfils the expectations of her builders and owners. After two preliminary spins under the critical eye of Captain Nat. Herreshoff, the yacht was turned over to Mr. C. Oliver Iselin, the managing owner. The first test was on Narragansett Bay and the second on the ocean off Brentons Reef, in a very light and fitful wind at the outset, and a ten-knot breeze at the close. The pace she set in the light wind promises well for her performance as a "drifter." In the stronger breeze she moved fast both on the wind and off, in reaching and running. Her spread of canvas is considerably in excess of that of either the *Columbia* or *Constitution*, and must be close to 16,000 square feet. Notwithstanding its great spread, she carries her sails well, and is very stiff when heeled to her bearings. As to her relative speed, no trustworthy opinion can be formed until she is tried with the older boats. Many yachts seem to be fast when sailing alone, notably challengers for the Cup. The first real trial of speed will be had at Glen Cove, Long Island Sound, May 21.

According to the photographs which are now at hand, *Shamrock III.* under sail in a strong breeze does not make so good a showing as the early reports led us to expect. The yacht is not pleasing either in her entrance or departure. She makes too much fuss under the bows, and carries too heavy a drag for great speed in hard weather. The photographs indicate that she will be probably at her best in light weather, which is what Sir Thomas expects to find here in August.

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Black-Bass-Fishing in Pennsylvania

ALL bass-fishermen acknowledge that the cold rushing waters of the mountain stream, the wild and picturesque scenery and bracing air, which generally form the environments of the brook trout, lend a charm to the pursuit of the speckled beauty, and have surrounded this fish with an atmosphere of sentiment and romance which has no doubt added much to the popularity of the *Salvelinus fontinalis* among sportsmen.

They also claim that, although the environment of the small-mouthed black bass is often tamer and of a less wild and rugged nature than that of the brook trout, the *Micropterus dolomieu* is a fiercer fighter and a stronger if not a gamier fish. Unfortunately, big black bass are seldom taken on the fly, except in the upper Mississippi and a few other favored places, and to win success and a creel of big fish the angler is, as a rule, compelled to become a bait fisherman.

The favorite bait changes only with the change of locality, but often with the time of day or the whim of the fish. On parts of the Delaware River small bullheads are considered the killing bait; at other places hellgrammites, minnows, and crickets are mainly used. In the neighborhood of Binghamton, on the Susquehanna, they use small lamprey eels; but the killing bait for this time of year in Pennsylvania seems to be frogs. The live frog baited through the lips is used for still-fishing, and a dead frog similarly hooked for skittering, casting, and trolling. It is in the dreamy, fascinating period between 4 P.M. and dark that the small-mouthed black bass bite best in the lakes.

There seems to be little room for doubt that the big black bass have their favorite haunts, and seldom wander far from their chosen feeding-grounds; furthermore, it appears to be equally true that the fish have an intimate acquaintance with the landscape under the water, and a thorough knowledge of the possible value of eel-grass, pickerel-weed, lily-pads, and jagged stones or sunken snags as line-breakers.

When a bass has been imprudent enough to hook itself to the line of an angler, it is not by chance that the creature hastens to wind the line around the gnarled root of a sunken snag, or, diving to the bottom, hopelessly entangles the line in the matted mass of subaqueous vegetation, and it would be absurd to call it accidental when the wily fish takes a sudden and circuitous course among the lily-pads, and by this means entwines the line among the tough stems of the plants.

All experienced fishermen know that when a large fish succeeds in making the line fast to an immovable object it is but a comparatively simple task for the scaly fox to free itself. Most of the well-known tricks of bass have for their object either a slack line or a line with no "give" to it, both of which conditions offer opportunities for freedom well known to the fish.

To secure a slack line the bass will often attempt a rush directly toward the fisherman, or make a spectacular leap in the air, or both, and in either case he tests the nerve and skill of the angler. These tactics of big bass account for the fact that they are so seldom taken by the farmer lads with their reckless long cane poles,—a fact which does not accord with the oft-told humorous stories, but which is patent to any one who has occasion to watch the two kinds of fishermen. The advantage of a slight elastic rod is that the fish can do all the pulling, and the rod, well managed, will keep a constant tension on the line, and a corresponding fatiguing resistance to the struggles of the fish; when the latter's struggles are so fierce as to endanger the rod, the expert angler allows the line to run until the strain is lessened and he may again trust his tough little rod.

It is this sort of work that gives a charm to angling with light tackle; one feels that with a light rod he not only gives the game a fighting chance, but in using it one pits one's own skill against that of the fish, and when it is at last landed after a long fight, who can deny that the angler is justly entitled to a feeling of triumph?

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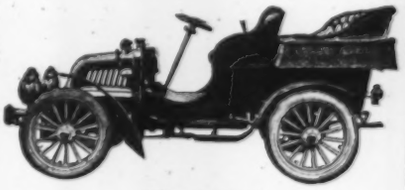

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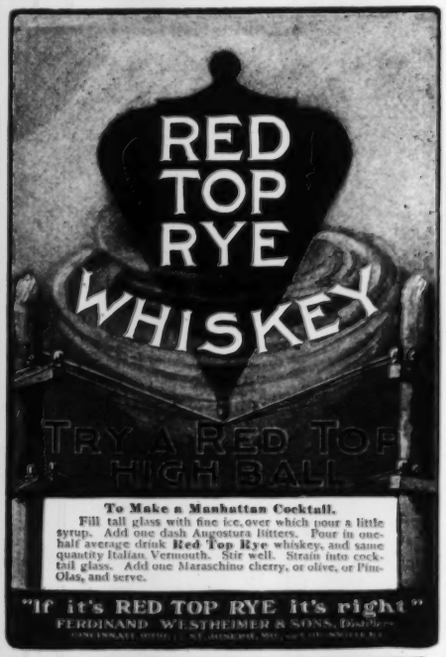
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